



MIND

A QUARTERLY REVIEW

OF

PSYCHOLOGY AND PHILOSOPHY.

I.—EDUCATION AS A SCIENCE.

THE scientific treatment of any art consists partly in applying the principles furnished by the several sciences involved, as chemical laws to agriculture; and partly in enforcing, throughout the discussion, the utmost precision and rigour in the statement, deduction and proof of the various maxims or rules that make up the art.

Both fecundity in the thoughts and clearness in the directions should attest the worth of the scientific method.

DEFINITIONS OF THE SCOPE OF EDUCATION.

First, let me quote the definition embodied in the ideal of the founders of the Prussian National System. It is given shortly as "the harmonious and equable evolution of the human powers"; at more length, in the words of Stein, "by a method based on the nature of the mind, every power of the soul to be unfolded, every crude principle of life stirred up and nourished, all one-sided culture avoided, and the impulses on which the strength and worth of men rest, carefully attended to". (Donaldson's *Lectures on Education*, p. 38.) This definition, which is pointed against narrowness generally, may have had special reference to the many omissions in the schooling of the foregone times: the leaving out of such things as bodily or muscular training; training in the senses or observation; training in art or refine-

ment. It farther insinuates that hitherto the professed teacher may not have done much even for the intellect, for the higher moral training, nor for the training with a view to happiness or enjoyment.

Acting on this ideal, not only would the educator put more pressure altogether on the susceptibilities of his pupils: he would also avoid over-doing any one branch; he would consider *proportion* in the things to be taught. To be all language, all observation, all abstract science, all fine art, all bodily expertness, all lofty sentiment, all theology,—would not be accepted as a proper outcome of any trainer's work.

The Prussian definition, good so far, does not readily accommodate itself to such circumstances as these:—namely, the superior aptitude of individuals for some things rather than for others; the advantage to society of pre-eminent fitness for special functions, although gained by a one-sided development; the difficulty of reconciling the 'whole man' with himself; the limited means of the educator, which imposes the necessity of selection according to relative importance.

Although by no means easy, it is yet possible to make allowance for these various considerations, under the theory of harmonious development; but after the operation is accomplished, the doubt will arise whether much is gained by using that theory as the defining fact of education.

In the very remarkable article on Education contributed by James Mill to the *Encyclopædia Britannica*, the end of Education is stated to be "to render the individual, as much as possible, an instrument of happiness, first to himself, and next to other beings". This, however, should be given as an amended answer to the first question of the Westminster Catechism—"What is the chief end of man?" The utmost that we could expect of the educator, who is not everybody, is to contribute his part to the promotion of human happiness in the order stated. No doubt the definition goes more completely to the root of the matter than the German formula. It does not trouble itself with the harmony, the many-sidedness, the wholeness, of the individual development; it would admit these just as might be requisite for securing the final end.

James Mill is not singular in his over-grasping view of the subject. The most usual sub-division of Education is into Physical, Intellectual, Moral, Religious, Technical. Now when we enquire into the meaning of Physical Education, we find it to mean the rearing of a healthy human being, by all the arts and devices of nursing, feeding, clothing and general regimen. Mill includes this subject in his article, and Mr. Herbert Spencer devotes a very interesting chapter to it

in his work on Education. It seems to me, however, that this department may be kept quite separate, important though it be. It does not at all depend upon the principles and considerations that the educator, properly so called, has in view in the carrying on of his work. The discussion of the subject does not in any way help us in educational matters, as most commonly understood; nor does it derive any illumination from being placed side by side with the arts of the recognised teacher. The fact of bodily health or vigour is a leading postulate in bodily or mental training, but the trainer does not take upon himself to lay down the rules of hygiene.

The inadvertence, for so I regard it, of coupling the Art of Health with Education is easily disposed of, and does not land us in any arduous controversies. Very different is another aspect of these definitions: that wherein the end of Education is propounded as the promotion of human happiness, human virtue, human perfection. Probably the qualification will at once be conceded, that Education is but one of the means, a single contributing agency to the all-including end. Nevertheless, the openings for difference of opinion as to what constitutes happiness, virtue or perfection, are very wide. Moreover, the discussion has its proper place in Ethics and in Theology, and if brought into the field of Education, should be received under protest.

Before entering upon the consideration of this difficulty, the greatest of all, I will advert to some of the other views of Education that seem to err on the side of taking in too much. Here, I may quote from the younger Mill, who, like his father, and unlike the generality of theorists, starts *more scientifico* with a definition. Education, according to him, "includes whatever we do for ourselves, and whatever is done for us by others, for the express purpose of bringing us nearer to the perfection of our nature; in its largest acceptation, it comprehends even the indirect effects produced on character and on the human faculties by things of which the direct purposes are different; by laws, by forms of government, by the industrial arts, by modes of social life; nay even by physical facts not dependent on the human will; by climate, soil, and local position". He admits, however, that this is a very wide view of the subject, and for his own immediate purpose advances a narrower view, namely—"the culture which each generation purposely gives to those who are to be its successors, in order to qualify them for at least keeping up, and, if possible, for raising, the improvement which has been attained". (*Inaugural Address at St. Andrews*, p. 4.)

Besides involving the dispute as to what constitutes 'perfection,'

the first and larger statement is, I think, too wide for the most comprehensive Philosophy of Education. The influences exerted on the human character by climate and geographical position, by arts, laws, government and modes of social life, constitute a very interesting department of Sociology, and have their place there and nowhere else. What we do for ourselves, and what others do for us, to bring us nearer to the perfection of our nature, may be education in a precise sense of the word, and it may not. I do not see the propriety of including under the subject the direct operation of rewards and punishments. No doubt we do something to educate ourselves, and society does something to educate us, in a sufficiently proper acceptation of the word; but the ordinary influence of society, in the dispensing of punishment and reward, is not the essential fact of Education, as I propose to regard it, although an adjunct to some of its legitimate functions.

Mill's narrower expression of the scope of the subject is not exactly erroneous; the moulding of each generation by the one preceding is not improperly described as an education. It is, however, grandiose rather than scientific. Nothing is to be got out of it. It does not give the lead to the subsequent exposition.

I find in the article 'Education,' in *Chambers's Encyclopædia*, a definition to the following effect:—"In the widest sense of the word a man is *educated*, either for good or for evil, by everything that he experiences from the cradle to the grave [say, rather, 'formed,' 'made,' 'influenced']. But in the more limited and usual sense, the term education is confined to the efforts made, of set purpose, to train men in a particular way—the efforts of the grown-up part of the community to inform the intellect and mould the character of the young [rather too much stress on the fact of influence from without]; and more especially to the labours of professional educators or schoolmasters." The concluding clause is the nearest to the point—the arts and methods employed by the schoolmaster; for, although he is not alone in the work that he is expressly devoted to, yet he it is that typifies the process in its greatest singleness and purity. If by any investigations, inventions or discussions, we can improve his art to the ideal pitch, we shall have done nearly all that can be required of a science and art of Education.

I return to the greater difficulty—namely, the question what is the end of all teaching; or, if the end be human happiness and perfection, what definite guidance does this furnish to the educator? I have already remarked that the enquiry is acknowledged to belong to other departments; and, if in these departments clear and unanimous answers have not been

arrived at, the educationist is not bound to make good the deficiency.

For this emergency, there is one thing obvious, another less obvious; the two together exhausting the resources of the educator.

The obvious thing is to fix upon whatever matters people are agreed upon. Of such the number is considerable, and the instances important. They make the universal topics of the schools.

The less obvious thing is, with reference to matters not agreed upon, that the educator should set forth at what cost these doubtful acquisitions would have to be made; for the cost must be at least one element in the decision respecting them. Whoever knows most about Education, is best able to say how far its appliances can cope with such aims as softening the manners, securing self-renunciation, bringing about the balanced action of all the powers, training the whole man, and so forth.

We shall see that one part of the science of Education consists in giving the ultimate analysis of all complex growths. It is on such an analysis that the cost can be calculated; and by means of this, we can best observe whether contradictory demands are made upon the educator.

What we have been drifting to, in our search for an aim, is the work of the school. This may want a little more paring and rounding to give it scientific form, but it is the thing most calculated to fix and steady our vision at the outset.

Now in the success of the schoolmaster's work, the first and central fact is the plastic property of the mind itself. On this depends the acquisition not simply of knowledge but of everything that can be called an acquisition. The most patent display of the power consists in memory for knowledge imparted. In this view the leading enquiry in the art of Education is how to strengthen memory. We are therefore led to take account of the several mental aptitudes that either directly or indirectly enter into the retentive function. In other words, we must draw upon the science of the human mind for whatever that science contains respecting the conditions of memory.

Although memory, acquisition, retentiveness, depends mainly upon one unique property of the intellect, which accordingly demands to be scrutinised with the utmost care, there are various other properties, intellectual and emotional, that aid in the general result, and to each of these regard must be had, in a Science of Education.

We have thus obtained the clue to one prime division of the subject—the purely psychological part. Of no less consequence

is another department at present without a name—an inquiry into the proper or natural order of the different subjects, grounded on their relative simplicity or complexity, and their mutual dependence. It is necessary to success in Education that a subject should not be presented to the pupil, until all the preparatory subjects have been mastered. This is obvious enough in certain cases: arithmetic is taken before algebra, geometry before trigonometry, inorganic chemistry before organic; but in many cases, the proper order is obscured by circumstances, and is an affair of very delicate consideration. I may call this the Analytic or Logical department of the theory of Education.

It is a part of scientific method to take strict account of leading terms, by a thorough and exhaustive enquiry into the meanings of all such. The settlement of many questions relating to education is embarrassed by the vagueness of the single term 'discipline'.

Farther, it ought to be pointed out, as specially applicable to our present subject, that the best attainable knowledge on anything is due to a combination of general principles obtained from the sciences, with well conducted observations and experiments made in actual practice. On every great question there should be a convergence of both lights. The technical expression for this is the union of the Deductive and Inductive Methods. The deductions are to be obtained apart, in their own way, and with all attainable precision. The inductions are the maxims of practice, purified, in the first instance, by wide comparison and by the requisite precautions.

I thus propose to remove from the Science of Education matters belonging to much wider departments of human conduct, and to concentrate the view upon what exclusively pertains to Education—the means of building up the acquired powers of human beings. The communication of knowledge is the ready type of the process, but the training operation enters into parts of the mind not intellectual—the activities and the emotions; the same forces, however, being at work.

Education does not embrace the employment of all our intellectual functions. There is a different art for directing the faculties in productive labour, as in the professions, in the original investigations of the man of science, or the creations of the artist. The principles of the human mind are applicable to both departments, but although the two come into occasional contact, they are so far distinct that there is an advantage in viewing them separately. In the practical treatise of Locke, entitled *The Conduct of the Understanding*, acquisition, production, and invention are handled promiscuously.

BEARINGS OF PHYSIOLOGY.

The science of Physiology, coupled with the accumulated empirical observations of past ages, is the reference in finding out how to rear living beings to the full maturity of their physical powers. This, as we have said, is quite distinct from the process of Education.

The art of Education assumes a certain average physical health, and does not enquire into the means of keeping up or increasing that average. Its point of contact with physiology and hygiene is narrowed to the plastic or acquisitive function of the brain—the property of fixing or connecting the nervous connections that underlie memory, habit and acquired power.

But as physiology now stands, we soon come to the end of its applications to the husbanding of the plastic faculty. The enquiry must proceed upon our direct experience in the work of education, with an occasional check or caution from the established physiological laws. Still, it would be a forgetting of mercies to undervalue the results accruing to education from the physiological doctrine of the physical basis of memory.

On this subject, physiology teaches the general fact that memory reposes upon a nervous property or power, sustained like every other physical power by nutrition, and having its alternations of exercise and rest. It also informs us that, like every other function, the plasticity may be stunted by inaction, and impaired by over-exertion.

As far as pure physiology is concerned, I invite everybody to reflect on one circumstance in particular. The human body is a great aggregate of organs or interests—muscles, digestion, respiration, senses, brain. When fatigue overtakes it, the organs generally suffer; when renovation has set in, the organs generally are invigorated. This is the first and most obvious consequence. It has next to be qualified by the remark that human beings are unequally constituted as regards the various functions; some being strong in muscle, others in stomach, others in brain. In all such persons the general invigoration is unequally shown; the favoured organs receive a share proportioned to their respective capitals: to him that hath shall be given. Still more pertinent is the farther qualification, that the organ that happens to be most active at the time receives more than its share; to exercise the several organs unequally is to nourish them unequally.

To come to the point as regards our immediate object. To increase the plastic property of the mind, you must nourish the brain. You naturally expect that this result will ensue when the body generally is nourished: and so it will, if there be no

exorbitant demands on the part of other organs, giving them such a preference as to leave very little for the organ of the mind. If the muscles or the digestion are unduly drawn upon, the brain will not respond to the drafts made upon it. Obversely, if the brain is constituted by nature, or excited by stimulation, so as to absorb the lion's share of the nutriment, the opposite results will appear; the mental functions will be exalted, and the other interests more or less impoverished. This is the situation for an abundant display of mental force.

But we must farther distinguish the mental functions themselves; for these are very different and mutually exclusive. Great refinement in the subdivisions is not necessary for the illustration. The broadest contrast is the emotional and the intellectual—feeling as pleasure, pain or excitement, and feeling as knowledge. These two in extreme manifestation are hostile to each other: under extreme emotional excitement the intellect suffers; under great intellectual exertion the emotions subside (with limitations unnecessary for our purpose).

But Intellect in the largest sense is not identical with the retentive or plastic operation. The laws of this peculiar phase of our intelligence are best obtained by studying it as a purely mental fact. Yet there is a physiological way of looking at it that is strongly confirmative of our psychological observations. On the physical or physiological side, memory or acquisition is a series of new nervous growths, the establishment of a number of beaten tracks in certain lines of the cerebral substance. Now the presumption is, that as regards the claim for nourishment this is the most costly of all the processes of the intelligence. To exercise a power once acquired should be a far easier thing, much less expensive, than to build up a new acquirement. We may be in sufficiently good condition for the one, while wholly out of condition for the other. Indeed success in acquirement, looking at it from the physiological probabilities, should be the work of rare, choice and happy moments: times when cerebral vigour is both abundant and well-directed.

BEARINGS OF PSYCHOLOGY.

The largest chapter in the Science of Education must be the following out of all the psychological laws that bear directly or indirectly upon the process of mental acquirement. Every branch of Psychology will be found available; but more especially the Psychology of the Intellect. Of the three great functions of the Intellect, in the ultimate analysis—Discrimination, Agreement, Retentiveness—the last is the most completely identified with the educative process; but the others enter in as constituents in a way peculiar to each. I will

select, for my present paper, DISCRIMINATION and RETENTIVENESS; and will endeavour to extract from the discussion of these great intellectual functions everything that they appear to yield for the ends of the educator. Although I can impart no novelty to the general statement of these functions, it is possible to make some unhackneyed remarks on their educational consequences.

Discrimination.

Mind starts from Discrimination. The consciousness of difference is the beginning of every intellectual exercise. To encounter a new impression is to be aware of change: if the heat of a room increases ten degrees, we are awakened to the circumstance by a change of feeling; if we have no change of feeling, no altered consciousness, the outward fact is lost upon us; we take no notice of it, we are said not to know it.

Our intelligence is, therefore, absolutely limited by our power of discrimination. The other functions of intellect, the Retentive power, for example, are not called into play, until we have first discriminated a number of things. If we did not originally feel the difference between light and dark, black and white, red and yellow, there would be no visible scenes for us to remember: with the amplest endowment of Retentiveness, the outer world could not enter into our recollection; the blank of sensation is a blank of memory.

Yet farther. The minuteness or delicacy of the feeling of difference is the measure of the variety and multitude of our primary impressions, and, therefore, of our stirred-up recollections. He that hears only twelve discriminated notes on the musical scale, has his remembrances of sounds bounded by these; he that feels a hundred sensible differences, has his ideas or recollections of sounds multiplied in the same proportion. The retentive power works up to the height of the discriminative power; it can do no more. Things are not remembered if they have not first been discriminated.

We have by nature a certain power of discrimination in each department of our sensibility. We can from the outset discriminate, more or less delicately, sights, sounds, touches, smells, tastes; and, in each sense, some persons much more than others. This is the deepest foundation of disparity of intellectual character, as well as of variety in likings and pursuits. If, from the beginning, one man can interpolate five shades of discrimination of colour where another can feel but one transition, the careers of the two men are foreshadowed and will be widely apart.

To observe this native inequality is important in predestining

the child to this or that line of special training. For the actual work of teaching, it is of more consequence to note the ways and means of quickening and increasing the discriminating aptitude. Bearing in mind the fact that until a difference is felt between two things intelligence has not yet made the first step, the teacher is bound to consider the circumstances or conditions favourable and unfavourable to the exercise.

(1.) It is not peculiar to discrimination, but is common to every mental function, to lay down, as a first condition, mental vigour, freshness and wakefulness. In a low state of the mental forces, in languor, or drowsiness, differences cannot be felt. That the mind should be alive, awake, in full force and exercise, is necessary for every kind of mental work. The teacher needs to quicken the mental alertness by artificial means, when there is a dormancy of mere indolence. He has to waken the pupil from the state significantly named *indifference*, the state where differing impressions fail to be recognised as distinct.

(2.) The mind may be fresh and alive, but its energies may be taking the wrong direction. There is a well-known antithesis or opposition between the emotional and the intellectual activities, leading to a certain incompatibility of the two. Under emotional excitement, the intellectual energies are enfeebled in amount, and enslaved to the reigning emotion. It is in the quieter states of mind that discrimination, in common with other intellectual powers, works to advantage. I will afterwards discuss more minutely the very delicate matter of the management of the various emotions in the work of teaching.

(3.) It must not be forgotten that intellectual exercises are in themselves essentially insipid, unattractive, indifferent. As exertion, they impart a certain small degree of the delight that always attends the healthy action of an exuberant faculty ; but this supposes their later developments, and is not a marked peculiarity in the child's commencing career. The first circumstance that gives an interest to discrimination is pleasurable or painful stimulus. Something must hang on a difference before the mind is made energetically awake to it. A thoroughly uninteresting difference is not an object of attention to any one.

The transitions from cold to hot, dark to light, strain to relief, hunger to repletion, silence to sound, are all more or less interesting, and all more or less impressive. But then they are vehement and sensational. It is necessary in order to the furnishing of the intelligence, that smaller and less sensational transitions should be felt ; the intellectual nature is characterised by requiring the least amount of emotional flash in order to

impress a difference. A loud and furious demonstration will certainly compel attention and end in the feeling of difference, but the cost is too great to be often repeated.

(4.) The great practical aid to the discovery and the retention of difference is immediate succession or, what comes to the same thing, close juxta-position. A rapid transition makes evident a difference that would not be felt after an interval, still less if anything else were allowed to occupy the mind in the meantime. This fact is sufficiently obvious, and is turned to account in easy cases; but is far from thoroughly worked out by the teacher and the expositor. Any trifling diversion will suffice to blind us to its importance.

We compare two notes by sounding them in close succession; two shades of colour by placing them side by side; two weights by holding them in the two hands, and attending to the two feelings by turns. These are the plain instances. The comparison of forms leads to complications, and we cease to attempt the same kind of comparison. For mere length we lay the two things alongside; so for an angle. For number, we can place two groups in contiguous rows—three by the side of four or five—and observe the surplus.

Mere size is an affair of simple juxta-position. Form, irrespective of size, is less approachable. A triangle and a quadrangle are compared by counting the sides, and resolving the difference of form into the simpler element of difference of number. A right-angled, an acute-angled, an isosceles triangle, must be compared by the juxta-position of angles. A circle and an oval are represented by the alternatives of curvature and diameters; in the one the curvature uniform, and the diameters equal, in the other, the curvature varying and the diameters unequal. The difference between a close and an open curve is palpable enough.

The geometrical forms are thus resolvable into very simple bases of comparison: and the teacher must analyse them in the manner now stated. For the irregular and capricious forms, the elementary conceptions are still the same—lineal size, number, angular size, curvature—but the mode of guiding the attention may be various. Sometimes there is a strong and overpowering similarity, with a small and unobtrusive difference; as in our ciphers (compare 3 and 5), and in the letters of our alphabet (C, G), and still more in the Hebrew alphabet. For such comparisons, the difference, such as it is, needs to be very clearly drawn or even exaggerated. Another method is to have models of the same size to lay over one another, so as to bring out the difference through the juxta-position. By a distinct effort, the teacher calls on the learner to view, with single-

minded attention, the differing circumstance, and afterwards to reproduce it by his own hand. One express lesson consists in asking the pupil what are the ciphers, or the letters, that are nearly alike, and what are the points of difference.

The higher arts of comparison to impress difference are best illustrated when both differences and agreements have to be noted. They would have to be resumed after the discussion of the intellectual force of Agreement or Similarity. The chief stress of the present explanation lies in regarding Discrimination as the necessary prelude of every intellectual impression, as the basis of our stored-up knowledge, or memory. Agreement is pre-supposed likewise; but there is not the same necessity, nor is it expedient, to follow out the workings of Agreement, before considering the plastic power of the intellect.

The Retentive Faculty.

This is the faculty that most of all concerns us in the work of Education. On it rests the possibility of mental growths or capabilities not given by nature.

Every impression made upon us, if sufficient to awaken consciousness at the time, has a certain permanence; it can persist after the original ceases to work; and it can be restored afterwards as an idea or remembered impression. The bursting out of a flame arouses our attention, gives a strong visible impression, and becomes an idea or deposit of memory. It is thought of afterwards without being actually seen.

It is not often that one single occurrence leaves a permanent and recoverable idea; usually, we need several repetitions for the purpose. The process of fixing the impression occupies a certain length of time; either we must prolong the first shock, or renew it on several successive occasions. This is the first law of Memory, Retention or Acquisition: "Practice makes perfect"; "Exercise is the means of strengthening a faculty," and so forth. The good old rule of the schoolmaster is simply to make the pupil repeat, rehearse, or persist at, a lesson, until it is learnt.

All improvement in the art of teaching consists in having regard to the various circumstances that facilitate acquirement, or lessen the number of repetitions for a given effect. Much is possible in the way of economising the plastic power of the human system; and when we have pushed this economy to the utmost, we have made perfect the Art of Education in one leading department. It is thus necessary that the consideration of all the known conditions that favour or impede the plastic growth of the system, should be searching and minute.

Although some philosophers have taught that all minds are

nearly equal in regard to facility of acquirement, a schoolmaster that would say so, must be of the very rudest type. The inequality of different minds in imbibing lessons, under the very same circumstances, is a glaring fact; and is one of the obstacles encountered in teaching numbers together, that is, classes. It is a difficulty that needs a great deal of practical tact or management, and is not met by any educational theory.

The different kinds of acquirements vary in minor circumstances which are important to be noticed after exhausting the general or pervading conditions. The greatest contrast is between what belongs to Intelligence, and what belongs to the Feelings and the Will. The more strictly Intellectual department comprises Mechanical Art, Language, the Sensible World, the Sciences, Fine Art; and to each of these heads may attach specialities not hard to assign.

General circumstances favouring Retentiveness.

(1.) The Physical condition. This has been already touched upon, both in the review of Physiology, and in the remarks on Discrimination. It includes general health, vigour and freshness at the moment, together with the farther indispensable proviso, that the nutrition, instead of being drafted off to strengthen the mere physical functions, is allowed to run in good measure to the brain.

In the view of mental efficiency, the muscular system, the digestive system, and the various organic interests, are to be exercised up to the point that conduces to the maximum of general vigour in the system, and no farther. They may be carried farther in the interest of sensual enjoyment, but that is not now before us. Hence a man must exercise his muscles, must feed himself liberally and give time to digestion to do its work, must rest adequately—all for the greatest energy of the mind, and for the trying work of education in particular. Nor is it so very difficult, in the present state of physiological and medical knowledge, to assign the reasonable proportions in all these matters, for a given case.

Everything tends to show that, in the mere physical point of view, the making of impressions on the brain, although never remitted during all our waking moments, is exceedingly unequal at different times. We must be well aware that there are moments when we are incapable of receiving any lasting impressions, and there are moments when we are unusually susceptible. The difference is not one wholly resolvable into more mental energy on the whole; we may have a considerable reserve of force for other mental acts, as the performance of routine offices, and not much for retaining new impressions; we

are capable of reading, talking, writing, and of taking an interest in the exercises; we may indulge emotions, and carry out pursuits, and yet not be in a state for storing the memory, or amassing knowledge. Even the incidents that we take part in sometimes fail to be remembered beyond a very short time.

What, then, is there so very remarkable and unique in the physical support of the plastic property of the brain? What are the moments when it is at the plenitude of its efficiency? What are the things that especially nourish and conserve it?

Although there is still wanting a careful study of this whole subject, the patent facts appear to justify us in asserting, that the plastic or retentive function is the very highest energy of the brain, the consummation of nervous activity. To drive home a new experience, to make an impression self-sustaining and recoverable, uses up (we are to suppose) more brain force than any other kind of mental exercise. The moments of susceptibility to the storing up of knowledge, the engraving of habits and acquisitions, are thus the moments of the maximum of unexpended force. The circumstances need to be such as to prepare the way for the highest manifestation of cerebral energy; including the perfect freshness of the system, and the absence of everything that would speedily impair it.

To illustrate this position, I may refer to the kind of mental work that appears to be second in its demand on the energy of the brain. The exercise of mental constructiveness—the solving of new problems, the applying of rules to new cases, the intellectual labour of the more arduous professions, as the law, where a certain amount of novelty attends every case that occurs—demands no little mental strain, and is easy according to the brain vigour of the moment. Still, these are exercises that can be performed with lower degrees of power; we are capable of such professional work in moments when our memory would not take in new and lasting impressions. In old age, when we cease to be educable in any fresh endowment, we can still perform these constructive exercises; we can grapple with new questions, invent new arguments and illustrations, decide what should be done in original emergencies.

The constructive energy has all degrees, from the highest flights of invention and imagination down to the point where construction shades off into literal repetition of what has formerly been done. The preacher in composing a fresh discourse puts forth more or less of constructiveness: in repeating prayers and formularies, in reading from book, there is only reminiscence. This is the third and least exigent form of mental energy; it is possible in the very lowest states of cerebral vigour. When acquisition is fruitless, construction is possible; when a slight

departure from the old routine passes the might of the intelligence, literal reminiscence may operate.

Another mode of mental energy that we are equal to, when the freshness of our susceptibility to new growths has gone off, is searching and noting. This needs a certain strain of attention; it is not possible in the very lowest tide of the nervous flow; but it may be carried on with all but the smallest degrees of brain power. When the scholar or the man of science ceases to trust his memory implicitly for retaining new facts that occur in his reading, observation or reflection, he can still keep a watch for them, and enter them in his notes. So in the hours of the day when memory is less to be trusted, useful study may still be maintained by the help of the memorandum and the note-book.

The indulgence of the emotions (when not violent or excessive) is about the least expensive of our mental exercises, and may go on when we are unfit for any of the higher intellectual moods, least of all for the crowning work of storing up new knowledge or new aptitudes. There are degrees here also; but, speaking generally, to love or to hate, to dominate or to worship, although impossible in the lowest depths of debility, are within the scope of the inferior grades of nervous power.

From this estimate of comparative outlay, we may judge what are the times and seasons and circumstances most favourable to acquirement. It may be assumed that in the early part of the day the total energy of the system is at its height, and that towards evening it flags; hence morning is the season of improvement. For two or three hours after the first meal, the strength is probably at the highest; total remission for another hour or two, and a second meal, (with physical exercise when the labour has been sedentary), prepare for a second display of vigour, although presumably not equal to the first; when the bout of this is worn off, there may, after a pause, be another bout of application, but far inferior in result to the first or even to the second. No severe strain should be attempted in this last stage; not much stress should be placed on the available plasticity of the system, although the constructive and routine efforts may still be kept up.

The regular course of the day may be interfered with by exceptional circumstances, but these only confirm the rule. If we have lain idle or inactive for the early hours, we may of course be fresher in the evening, but the late application will not make up for the loss of the early hours; the nervous energy will gradually subside as the day advances however little exertion we may make. Again, we may at any time determine an outburst of nervous energy by persistent exercise and by

stimulation, which draws blood to the brain, without regard to circumstances and seasons, but this is wasteful in itself and disturbing to the healthy functions.

As a general rule, the system is at its greatest vigour in the cold season of the year; and most work is done in winter. Summer studies are comparatively unproductive.

The review of the varying plasticity in the different stages of life might be conducted on the same plan of estimating the collective forces of the system, and the share of these available for brain work, but other circumstances have to be taken into the account, and I do not enter upon the question here.

There are many details in the economy of the plastic power that have a physical as well as a mental aspect. Such are those relating to the strain and remission of the Attention, to the pauses and alternations during the times of drill, to the moderating of the nervous excitement, and other matters. These should all find a place under the head of the Retentive function. It is expedient now to take up the consideration of the subject from the purely mental side.

(2.) The one circumstance that sums up all the mental aids to plasticity is CONCENTRATION. A certain expenditure of nervous power is involved in every adhesion, every act of impressing the memory, every communicated bias; and the more the better. This supposes, however, that we should withdraw the forces, for the time, from every other competing exercise; and especially, that we should redeem all wasting expenditure for the purpose in view.

It is requisite, therefore, that the circumstances leading to the concentration of the mind should be well understood. We assume that there is power available for the occasion, and we seek to turn it into the proper channel. Now there is no doubt that the will is the chief intervening influence, and the chief stimulants of the will are, as we know, pleasure and pain. This is the rough view of the case. A little more precision is attainable through our psychological knowledge.

And first, the Will itself as an operating or directing power, that is to say, the moving of the organs in a given way under a motive, is a growth or culture; it is very imperfect at first, and improves by usage. A child of twelve months cannot by any inducement be prompted readily to clap its hands, to point with its forefinger, to touch the tip of its nose, to move its left shoulder forward. The most elementary acts of the will, the alphabet of all the higher acquisitions, have first to be learned in a way of their own; and until they have attained a sufficient advancement, so as to be amenable to the spur of a motive, the teacher has nothing to go upon.

I have elsewhere described this early process, as I conceive it, in giving an account of the development of the Will. In the practice of education, it is a matter of importance as showing at what time mechanical instruction is possible, and what impedes its progress at the outset, notwithstanding the abundance of plasticity in the brain itself. The disciplining of the organs to follow directions would seem to be the proper province of the Infant school.

Coming now to the influences of concentration, we assign the first place to intrinsic charm, or *pleasure in the act itself*. The law of the Will, in its side of greatest potency, is that Pleasure sustains the movement that brings it. The whole force of the mind at the moment goes with the pleasure-giving exercise. The harvest of immediate pleasure stimulates our most intense exertions, if exertion serves to prolong the blessing. So it is with the deepening of an impression, the confirming of a bent or bias, the associating of a couple or a sequence of acts; a coinciding burst of joy awakens the attention and thus leads to an enduring stamp on the mental framework.

The engraining efficiency of the pleasurable motive requires not only that we should not be carried off into an accustomed routine of voluntary activities, such as to give to the forces another direction, as when we pace too and fro in a flower garden; but also that the pleasure should not be intense and tumultuous. The law of the mutual exclusion of great pleasure and great intellectual exertion forbids the employment of too much excitement of any kind, when we aim at the most exacting of all mental results—the forming of new adhesive growths. A gentle pleasure that for the time contents us, there being no great temptation at hand, is the best foster-mother of our efforts at learning. Still better, if it be a growing pleasure; a small beginning, with steady increase, never too absorbing, is the best of all stimulants to mental power. In order to have a yet wider compass of stimulation, without objectionable extremes, we might begin on the negative side, that is, in pain or privation, to be gradually remitted in the course of the studious exercise, giving place at last to the exhilaration of a waxing pleasure. All the great teachers from Socrates downwards seem to recognise the necessity of putting the learner into a state of pain to begin with; a fact that we are by no means to exult over, although we may have to admit the stern truth that is in it. The influence of pain, however, takes a wider range than here supposed, as will be seen under our next head.

A moderate exhilaration and cheerfulness growing out of the act of learning itself is certainly the most genial, the most effectual means of cementing the unions that we desire to form

in the mind. This is meant when we speak of the learner having a taste for his pursuit, having the *heart* in it, learning *con amore*. The fact is perfectly well known; the error, in connection with it, lies in dictating or enjoining this state of mind on everybody in every situation, as if it could be commanded by a wish, or as if it were not itself an expensive endowment. The brain cannot yield an exceptional pleasure without charging for it.

Next to pleasure in the actual, as a concentrating motive, is pleasure in *prospect*, as in learning what is to bring us some future gratification. The stimulus has the inferiority attaching to the idea of pleasure as compared with the reality. Still it may be of various degrees, and may rise to a considerable pitch of force. Parents often reward their children with coins for success in their lessons; the conception of the pleasure in this case is nearly equal to a present tremor of sense-delight. On the other hand, the promises of fortune and distinction, after a long interval of years, have seldom much influence in concentrating the mind towards a particular study.

Let us now view the operation of Pain. By the law of the will, pain repels us from the thing that causes it. A painful study repels us, just as an agreeable one attracts and detains us. The only way that pain can operate is when it is attached to neglect, or to the want of mental concentration in a given subject; we then find pleasure, by comparison, in sticking to our task. This is the theory of punishing the want of application. It is in every way inferior to the other motives; and this inferiority should be always kept in view in employing it, as every teacher often must with the generality of scholars. Pain is a waste of brain-power; while the work of the learner needs the very highest form of this power. Punishment works at a heavy percentage of deduction, which is still greater as it passes into the well-defined form of terror. Every one has experienced cases where severity has rendered a pupil utterly incapable of the work prescribed.

Discarding all *a priori* theories as to whether the human mind can be led on to study by an ingenious system of pleasurable attractions, we are safe to affirm that if the physical conditions are properly regarded, if the work is within the compass of the pupil's faculties, and if a fair amount of assistance is rendered in the way of intelligible direction, although some sort of pain will frequently be necessary, it ought not to be so great as to damp the spirits and waste the plastic energy.

The line of remark is exactly the same for pain in prospect, with allowance for the difference between reality and the idea. It is well when prospective pain has the power of a motive,

because the future had consequences of neglect are so various and so considerable, as to save the resort to any other. But since the young mind in general is weak in the sense of futurity, whether for good or for evil, only very near, very intelligible and very certain pains can take the place of presently acting deterrents.

In the study of the human mind, we need, for many purposes, to draw a subtle distinction between feeling as Pleasure or Pain, and feeling as Excitement not necessarily pleasurable or painful. This subtlety cannot be dispensed with in our present subject. There is a form of mental concentration that is properly termed excitement, and is not properly termed pleasurable or painful excitement. A loud or sudden shock, a rapid whirling movement, stirs, wakens or excites us; it may also give us pleasure or pain, but it may be perfectly neutral: and even when there is pleasure or pain, there is an influence apart from what would belong to pleasure or pain, as such. A state of excitement seizes hold of the mind for the time being and shuts out other mental occupations; we are engrossed with the subject that brought on the state, and are not amenable to extraneous influences, until that has subsided. Hence, excitement is pre-eminently a means of making an impression, of stamping an idea in the mind: it is strictly an intellectual stimulus. There is still the proviso (under the general law of incompatibility of the two opposite moods) that the excitement must not be violent and wasting. In well-understood moderation, excitement is identical with attention, mental engrossment, the concentration of the forces upon the plastic or cementing operation, the rendering permanent as a recollection what lies in the focus of the blaze. Excitement, so defined, is worthless as an end, but is valuable as a means; and that means is the furtherance of our mental improvement by driving home some useful concatenation of ideas.

Another subtlety remains—a distinction within a distinction. After contrasting feeling as excitement with feeling as pleasure or pain, we must separate the useful from the useless or even pernicious modes of excitement. The useful excitement is what is narrowed and confined to the subject to be impressed; the useless, and worse than useless, excitement is what spreads far and wide, and embraces nothing in particular. It is easy to get up the last species of excitement—the vague, scattered, and tumultuous mode—but this is not of avail for any set purpose; it may be counted rather as a distracting agency than as a means of calling forth and concentrating the attention upon an exercise.

The true excitement for the purpose in view is what grows

out of the very subject itself, surrounding and adhering to that subject. Now for this kind of excitement, the recipe is continuous application of the mind in perfect surrounding stillness. Restrain all other solicitation of the senses, keep the attention upon the one act to be learnt; and, by the law of nervous and mental persistence, the currents of the brain will become gradually stronger and stronger, until they have reached the point when they do no more good for the time. This is the ideal of concentration by neutral excitement.

The enemy of such happy neutrality is pleasure from without; and the youthful mind cannot resist the distraction of a present pleasure, or even the scent of a far-off pleasure. The schoolroom is purposely screened off from the view of what is going on outside; while all internal incidents that hold out pleasurable diversion are carefully restrained, at least during the crisis of a difficult lesson. A touch of pain, or apprehension, if *only slight*, is not unfavourable to the concentration.

A very important observation remains, namely, that relationship of Retention to Discrimination which was stated in introducing the function of Discrimination. The consideration of this relationship illustrates with still greater point the true character of the excitement that concentrates and does not distract nor dissipate the energies. The moment of a delicate discrimination is the moment when the intellectual force is dominant; emotion spurns nice distinctions, and incapacitates the mind for feeling them. The quiescence and stillness of the emotions enables the mind to give its full energies to the intellectual processes generally; and of these, the fundamental is perception of difference. Now the more mental force we can throw into the act of noting a difference, the better is that difference felt, and *the better it is impressed*. The same act that favours discrimination, favours retention. The two cannot be kept separate. No law of the intellect appears to be more certain than the law that connects our discriminating power with our retentive power. In whatever class of subjects our discrimination is great—colours, forms, tunes, tastes—in that class our retention is great. Whenever the attention can be concentrated on a subject in such a way as to make us feel all its delicate lineaments, which is another way of stating the sense of differences, through that very circumstance a great impression is made on the memory; there is no more favourable moment for engraving a recollection.

The perfection of neutral excitement, therefore, is typified by the intense rousing of the forces in an act or a series of acts of discrimination. If by any means we can succeed in this, we are sure that the other intellectual consequences will follow. It is a rare and difficult attainment in volatile years: the con-

ditions, positive and negative, for its highest consummation cannot readily be commanded. Yet we should clearly comprehend what these conditions are; and the foregoing attempt has been made to seize and embody them.

Pleasure and pain, besides acting in their own character, that is, directing the voluntary actions, have a power as mere excitement, or as wakening up the mental blaze, during which all mental acts, including the impressing of the memory, are more effective. The distinction must still be drawn between concentrated and diffused excitement, between excitement *in*, and excitement *away from*, the work to be done. Pleasure is the most favourable adjunct, if not too great. Pain is the more stimulating or exciting; under a painful smart the forces are very rapidly quickened for all purposes, until we reach the point of wasteful dissipation. This brings us round again to the Socratic position, the preparing of the learner's mind by the torpedo or the gad-fly.

The full compass of the operation of the painful stimulant is well shown in some of our most familiar experiences as learners. In committing a lesson to memory, we con it a number of times by the book: we then try without the book. We fail utterly, and are slightly pained by the failure. We go back to the book, and try once more without it. We still fail, but strain the memory to recover the lost trains. The pains of failure and the act of straining stimulate the forces; the attention is roused seriously and energetically. The next reference to the book finds us far more receptive of the impression to be made; the weak links are now re-inforced with avidity, and the next trial shows the value of the discipline that has been undergone.

One remark more will close the view of the conditions of plasticity. It is that Discrimination and Retentiveness have a common support in rapidity and sharpness of transition. A sharp and sudden change is commonly said to make a strong *impression*: the fact implied concerns discrimination and retention alike. Vague, shadowy, ill-defined boundaries fail to be discriminated, and the subjects of them are not remembered. The educator finds great scope for his art in this consideration also.

A. BAIN.

II.—AN INTROSPECTIVE INVESTIGATION.

I commenced more than twenty years ago an introspective investigation in reference to a disputed point in mental science—whether or not man is a personal agent in the forming or producing of his will-to-act, or, as some call it, his act of will. "I never yet caught myself," says Jonathan Edwards (in his *Dissertation concerning Liberty and Necessity*, p. 171), "in the act of *making a volition*, if this mean anything more than *having a volition*, or being the subject of it. If any man be conscious that he makes his own volitions, he is doubtless conscious of two distinct acts in this; one *the act made* by himself, another *the act making* or by which he makes *the act made*. Now will any man profess to the world, that he is or ever has been conscious of these distinct acts?" (The italics are in the original.) The volition—the will-to-act—is here spoken of, first as a mental state, of which man is "the subject," and then as a mental act, the act by which man makes his acts.

In common with Jonathan Edwards, and with many others, I had never yet caught myself making a volition, and therefore I did not believe that man has any "power efficiently to cause a volition in himself," or to form his will-to-act, or his determination (p. 170). My opinion upon this point was very plainly stated by Mr. J. S. Mill, when, in his *Logic*, he said that our will-to-act is "given us, not by any efforts of ours, but by circumstances which we cannot help"; and when, speaking of the idea that man has a "power over his volitions," in his *Examination of Sir William Hamilton's Philosophy*, he said, "in common with one-half of the psychological world, I am wholly ignorant of my possessing any such power".

I desired to ascertain, if I could, what it could be which caused the common belief that man is a personal agent in the forming of his determinations. What I believed upon this point was, that our will-to-act is the effect of the strongest motive-feeling, and that our motive-feelings and their relative strength, upon every occasion, are effects of conditions within us and external to us at the time; and that, therefore, our motive-feelings and our will-to-act are formed "for us, and not by us". I was persuaded into this belief, with no little difficulty, some twenty years before, being then more than twenty years of age, and having until then believed vaguely, as persons do who have never thought particularly upon the subject, and as many do who have thought particularly upon it, that our will-to-act is made by ourselves. During the intervening more than twenty years I often discussed the subject, verbally and in writing, and my belief that man is not a personal agent in the forming of his

determinations was confirmed by the knowledge that many distinguished writers upon mental science were of the same opinion, and by the inability of the opponents of this view to point out the mental facts by which they were made conscious, as they said, that this opinion is not correct. But I was often disappointed to find that I was not able to convince the opponents of this opinion that they were in error in denying it. They said they were conscious—they perceived introspectively—that they did something in the forming of their determinations; they were conscious of a *nisus* or effort. And when I pointed out to them that our motive-feelings and their relative strength are dependent upon internal and external conditions, I was told by some of them that they felt that they themselves produced the preponderance of the motive-feeling from which they acted. But I asked them in vain to describe or point out to me *what* they did, or *how* they produced the final preponderance of the motive-feeling. They could only say that they were conscious of a *nisus* or effort in willing, or in the forming of their will-to-act. And from writers upon the subject I could not obtain any more information upon this point. I therefore at last set to work to try to ascertain what there could be in their mental experience to excite in them what I believed to be the illusory idea that they did something in the forming of their determinations.

I. Knowing that the desired information could only be obtained by examining into the *facts* of the subject, and that I could only examine the facts of the subject, directly, by observing my own mental experience, I began to ask myself, "What do we do in willing, or what is there in willing, to account for the supposed consciousness of effort in connection with it?" I found that the will to do an act, in the strict sense of the term, is the mental fact which immediately precedes an act. It is not a wish or a desire; because we may have a wish or a desire to do an act, and not have a will to do it. And it is not any other feeling or emotion which is not immediately followed by the act to which it has reference. The *will* to do an act is always followed immediately by the act. We cannot do an act (we cannot move a finger, for instance) without having a will to do it; and we cannot have a will to do an act (to move our finger, for instance), and not do it. And to will to do an act is to *have* a will to do it; as to desire to do an act is to *have* a desire to do it. The will-to-act, therefore, is a mental *state*; it is not an "*act* of will". We do not *do* a will to do an act; we have it. There is no action, therefore—no *nisus* or effort—in willing. Voluntary *nisus* or effort is preceded by a will to make it; and to confound the effort with the will to make it, and to imagine that a will-to-act is an *act* of will, is a fundamental mistake.

II. My next question was, "*What is a will-to-act?*" Looking again into the facts of my mental experience, I found, first, that to have a will-to-act we must have a *thought* of the act which we have a will to do. But I found that a thought of an act is not a will to do it. In the will-to-act, therefore, there must be the thought and something more. What is this something more? It must be emotion. What is this emotion, and how shall we describe it? It is the kind of emotion which we feel when we have a strong impulse to do an act. And therefore we may call it impulsive emotion. As a desire to do an act, for instance, is a thought of the act, combined with the emotion of desire; and as in joy, hope, fear, &c., we have a thought in conjunction with the peculiar emotion of these feelings; so in a will to do an act we have a thought of the act willed, in conjunction with emotion. If we carefully observe the combination of thought and feeling which immediately precedes an act (or rather, if we carefully recollect it—for the transition from the will-to-act to the act is so instantaneous that we have no time to observe the will-to-act—we can only recollect it), we may perceive distinctly that it is so. And we may perceive that a will to do an act is a decisive impulse to do it, and that what is commonly called an impulse, which is not followed by the act, is an indecisive impulse. In the will-to-act, therefore, the impulsive emotion is stronger than it is in the indecisive impulse. I had thus obtained a second step in the investigation. I had ascertained decisively, by distinctly tracing the *facts* of the subject, first, that a will-to-act is the mental state which is the immediate mental antecedent of action, and that it is not an "*act of will*"; and secondly, that it is a combination of thought and emotion, and that it is a decisive impulse to do an act.

III. The next question to be asked of the facts of our mental experience was, "*What is mental action?*" We do not *do* our sensations, or our thoughts, or our emotions, or our volitions; and what more is there for us to do in our mental operations? What do we do, for instance, when we attend? We are told by some philosophers that we do nothing when we attend to a thought—that "*to have an interesting idea and to attend to it are the same*". But we are conscious—we perceive introspectively—that we *do* something, that we are not passive in attending to a thought, however passive we may be at times in having thoughts. And we are told by other philosophers that attention is a mental act, but they do not tell us *what* we do in attending. If we observe carefully the mental facts which occur in us when we attend to a thought, we find that, when we do so, we *keep up* the thought to which we are said to attend. Attention, then, is not simply a mental act—it is an active mental operation, in which

we have thoughts and keep them up; as looking (the mental part of it) is an active mental operation, in which we have perceptions of sight and keep them up. What we *do*, then, in attending, and in other active mental operations, is, that we *keep up* thoughts or perceptions. It is here, then, if anywhere, that we shall find the *nîsus* of which the philosophers are conscious who say that we are personal agents in the forming of our determinations, or that we produce the preponderance of the motive-feeling, or the impulse, which becomes decisive.

IV. I had next to ascertain whether by keeping up thoughts we can in any way assist in the forming of our will-to-act, or in producing the preponderance of one impulse over another, and whether, therefore, there is the personal agency, or effort, in the forming of our determinations, of which some philosophers say they are conscious, but of which, if they are so, their consciousness is so vague or dim that they are unable to point out the facts of the mental process. And I therefore sought to ascertain what is the effect of keeping up a thought. And I found that when we keep up a thought it becomes clearer or more distinct; as when we keep up a perception of sight, by looking at an object, the perception becomes clearer or more distinct. And that as the thought is kept up the emotion which is connected with it becomes stronger. And that when one thought is kept up other thoughts are kept down, more or less, and the emotion connected with them is also kept down. This is what is done, by instinct more than by intelligent intention, when men endeavour to "drive away sorrow". They drive away the thoughts with which their emotion of sorrow is connected, by keeping up other thoughts; and they succeed or do not succeed in producing the desired effect, as they persevere and are successful, or not, in their endeavours to keep away or to modify the thoughts by which their grief is excited, and as their endeavours are well or ill directed.

V. Applying the facts which had now been clearly ascertained, in tracing the mental process by which our volitions are produced, I found that when there are more impulses than one, as when we are in doubt whether we will do this act or that, we may, and in many cases we do, increase the strength of one of the impulses by keeping up the thought which is the intellectual part of it. This is what we do when we successfully resist a temptation of any kind. In cases in which we merely form a choice by ascertaining, so far as we are able to do so, the course of action which will be the most beneficial, it is still by obtaining and keeping up the thoughts or the perceptions by which we are conscious of the advantages and the disadvantages of the acts under consideration that we obtain the decisive impulse, or

are personal agents in the forming of it. In such a simple case, for instance, as in choosing an orange from a heap, we look first at one orange and then at another, until we find one which appears to us to be the best. And we thus form the determination to take that particular orange. It is evident, therefore, when we know the facts of the subject, that it is a mistake to suppose that our will-to-act is in all cases "given us without any efforts of ours". And if "we never yet caught ourselves in the act of making a volition," it was not because we never did make one—it was because our ideas of the mental facts of the case were so vague and erroneous that it was impossible that we should know what we were doing when we did so. In some cases, it is true, the forming of the decisive impulse is so instantaneous that our will to act may truly be said to be "given us without any effort of ours". As when, for instance, one orange is offered to us and we take it. But even in such a case, there is often a rapid keeping up of various thoughts before we decide. And in very many cases we attend carefully to various considerations before our decision is produced, and are therefore distinctly personal agents in the forming of it.

The instinctive consciousness of the difference between forming a choice or a determination, and having a choice or a determination when it has been formed, is shown in the common language of men. To "elect," to "determine," to "decide" upon a course of action, is to *form* an election, a determination, a decision, a will-to-act. To "prefer" is to *have* a preference. But the vagueness of the instinctive consciousness is shown by the use of same word in both senses. To "choose," for instance, may mean either to form a choice, or to have a choice or preference when it has been formed. And the verb to "will," though it can only be used correctly in the sense of *having* a will-to-act, is often used in the active sense, or as if to will to do an act were to do an "act of will"—as in the quotation above from Jonathan Edwards.

We have a curious illustration of the vague consciousness of effort in the forming of our determinations, while in theory the occurrence of effort is denied, in a remark of Mr. Mill, in his *Logic*, when he says that "even in yielding to his temptations a person may know that he could resist". But to "resist" a temptation is to *do* something in the forming of our determination. Mr. Mill's explanation that in such a case "there would not be required a stronger desire than the individual knows himself to be capable of *feeling*," is no description of what takes place when we "resist" a temptation. When we resist a temptation we *do* something to produce in ourselves the preponderating impulse to refrain from doing what we are tempted

to do. And nothing of this kind could occur if our will to act were at all times "given us without any efforts of ours".

VI. We have thus obtained the object of our introspective investigation. And the result turns out to be the reverse of that which was looked for. It is, however, a result which may be said to be scientifically certain; for it has been obtained by the process of observing and re-observing the *facts* of the subject, and its correctness is guaranteed by the facts, which may be observed again and again, and have been so observed until what may be called complete practical verification has been obtained. While these facts were viewed and spoken of in the confused and erroneous manner in which in various ways they have been viewed and spoken of by philosophers and by mankind in general, it was impossible that the mental process by which we form determinations should be ascertained. It was by obtaining step by step, and by slow degrees, correct and clear perceptions of the nature of the mental facts which occur in this process, that the process was analysed. And now that it is analysed, the facts of it are seen to be extremely simple, although they appeared mysterious and inscrutable before—as all facts are while they are not understood and cannot be pointed out.

Many highly important consequences follow from the correct view of the subject which has thus been obtained, and many comments upon it may be made. But the consideration of these must be reserved. In the meantime, the reader has now before him, so far, in a short compass, the result of years of careful investigation.

HENRY TRAVIS.

III.—HEDONISM AND ULTIMATE GOOD.

It has often been observed that systematic enquiry into the nature of the Supreme End of human action, the *Bonum* or *Summum Bonum*, belongs almost exclusively to ancient ethical speculation; and that in modern ethics its place is supplied by an investigation of the fundamental Moral Laws, or Imperatives of the Practical Reason. While the ancients appear as chiefly endeavouring to determine the proper ultimate object of rational pursuit, the moderns are chiefly occupied in discussing the basis and validity of a received code of rules, for the most part restrictive rather than directive of human effort. But though this difference has frequently been noticed, I am not aware that any distinct explanation of it has ever been offered: while again there are many signs that ethical speculation in England has reached a point at which this old question as to the nature of

Ultimate Good again presents itself as fundamental. If these signs are not misleading, it will be interesting to ascertain, from a comparison between ancient and modern thought, how far the speculative excursion which has ended in conveying us back to the old problem has brought us to face it from a new point of view, and under new conditions.

When we compare the Greek investigation of Ultimate Good with our own, we find an important difference in the very form of the fundamental question. What we, as moralists, are naturally led to seek, is the true account of *general* good; for most of us almost unhesitatingly assume that moral action, as such, must have relation to universal ends. But for the Greek moralist, the primary question as naturally and inevitably took an egoistic form.* The Good which he studied was 'good for himself,' or for any other individual philosophic soul, enquiring after the true way of life. This difference is sufficiently obvious and has been noticed by more than one writer; but it has perhaps been somewhat obscured for modern readers by the antithetical fact, to which more attention has been drawn, that the political speculation of Greece differs from our own precisely in its non-individualistic character. There is really no contradiction between the assumption in ethics of the agent's private good as the ultimate determinant of rational action; and the assumption in politics of the good of the state—without regard to any 'natural rights' of its component parts—as the ultimate end and standard of right political organisation. Indeed it would not be difficult to show that the two assumptions naturally belong to the same stage in the development of practical philosophy. Still they have somewhat tended to confuse each other, through that blending of politics with ethics in philosophical discussion which characterises the period from Socrates to Aristotle; and the confusion has been further increased by the analogy between the Individual and the State, which forms the basis of Plato's most famous treatise. This very analogy, however, when carefully examined, brings out most strikingly the characteristic which it, at first, tends to obscure; for the individual man being considered as a polity of impulses, his good is made to consist essentially in the due ordering of the internal relations of this polity, and is only secondarily and indirectly realised in the relations of this complex individual to other men. And in Aristotle's detailed

* This statement requires some qualification in so far as it concerns Plato, on account of his peculiar ontology. Still this does not so much affect the question Plato asked, as the answer he gave to it, and even that only to a limited extent; not (*e. g.*) in the *Philebus*, where the ἀγαθόν investigated is just the ἀνθρώπινον ἀγαθόν of Aristotle.

analysis of the moral ideal of his age, the fundamental egoism of the form in which it is conceived is continually illustrated, in striking contrast to the modern tendency to regard "the scope and object of ethics as altogether social".* The limits of Aristotle's Liberality are not determined by any consideration of its effect on the welfare of its recipients, but by an intuitive sense of the noble and graceful quality of expenditure that is free without being too lavish; and his Courageous warrior is not commended as devoting himself for his country, but as attaining for himself, even amid pains and death, the peculiar *καλόν* of a courageous act.

No doubt we must bear in mind that this egoism is chiefly formal. The orthodox moralist, from Prodicus to Chrysippus, in recommending the preference of Virtue to Pleasure, is substantially recommending the sacrifice of individual inclinations to social claims; and the explicit "*communis utilitas nostræ anteponenda*" of later Stoicism, (which in this respect forms a transition from the ancient point of view to the modern), is no doubt implicit in the practical teaching of earlier schools. Still the effect of the egoistic form is very clearly seen in the actual course of ethical discussion. It rendered it absolutely necessary for the orthodox moralist to settle the relation of the individual's virtue to his Pleasure and Pain. A modern moralist may leave this undetermined. He cannot of course overlook the paramount influence of pleasure and pain, in the actual determination of human actions; and he must be aware that the obtaining of future pleasure and the avoiding of future pain constitute at least the chief part of the common notion of 'happiness,' 'interest,' 'good on the whole,' or whatever else we call the end which a prudent man, as such, has in view. But he may regard the discussion of this as bearing on the Sanctions of morality, not Morality itself; that is not on the theory of what duty is, but on the practical question how a man is to be made to do his duty. The Greek, however, who regarded the determination of the individual's good as supplying the fundamental principle on which the whole code of rules for reasonable conduct must ultimately depend, was obliged at the outset to consider the popular view that this good was Pleasure. He either, with the Cyrenaics and Epicureans, accepted this view unreservedly, and held Virtue to be valuable merely as a means to the enjoyment of the virtuous agent; or, with Zeno, he rejected it altogether, and maintained the intrinsic valuelessness of pleasure; or with Socrates, Aristotle, and Plato in his soberer moods, he argued the inseparable connection of the best and really pleasantest pleasure with the exercise of

* Cf. MIND III., p. 341.

virtue. The first position was offensive to the moral consciousness; the third imposed on it the necessity of proving what could never be really proved without either dialectical tricks or assumptions obviously transcending experience; and it was not surprising that the chief part of the moral earnestness of ancient society was ultimately enlisted on the side of the second alternative. Still the inhuman severity of the paradox that 'pleasure and pain are indifferent to the wise man,' never failed to have a repellent effect; and the imaginary rack on which an imaginary sage had to be maintained in perfect happiness, was at any rate a dangerous instrument of dialectical torment for the actual philosopher.

Christianity extricated the moral consciousness from this dilemma between base subserviency and inhuman indifference to the feelings of the moral agent. It compromised the long conflict between Virtue and Pleasure, by transferring to another world the fullest realisation of both; thus enabling orthodox morality to assert itself, as reasonable and natural, without denying the concurrent reasonableness and naturalness of the individual's desire for bliss without alloy. Hence when independent ethical speculation recommences in England after the Middle Ages, we find that the dualism—if I may so say—of the Practical Reason, which Butler afterwards formulated, is really implicit in all the orthodox replies to Hobbes. It is not denied in these replies that man's 'natural good' is pleasure, or that the self-love which seeks the agent's greatest happiness is a rational principle of action; they are only concerned to maintain the independent reasonableness of Conscience, and the objective validity of moral rules derived from a quite other source than the calculations of self-interest. Thus, for example, though in Cumberland's view the ultimate end and rational basis of the moral code is "commune bonum omnium rationalium," the obligation of the code on each individual "rational" is imposed "sub pœna felicitatis amittendæ aut propter spem ejusdem acquirendæ". And even Clarke, who is often thought to have carried his argument for the independence of morality up to the point of paradox, is yet after all found to make only the very moderate claim "that Virtue deserves to be chosen for its own sake, and Vice to be avoided, though a man was sure of his own particular *neither to gain nor lose anything by the practice of either*". But since in the actual world "the practice of vice is accompanied with great temptations, and allurements of pleasure and profit, and the practice of virtue is often attended with great calamity, losses, and sometimes with death itself, this alters the question,"—and, in fact, Clarke is of opinion, not only that men under these circumstances will not always prefer

Virtue to Vice, but also that "it is *not very reasonably to be expected* that they should". Butler, however, was the first to give with perfect precision the *differentia* of what we may call broadly the modern view of Ethics, in stating "reasonable self-love and conscience" as the "*two* chief or superior principles in the nature of man"; whereas it was a fundamental assumption of all the schools of philosophy that sprang from Socrates, that there is *one* naturally "chief or superior principle" in every rational being which impels him to seek his own true good.

It is true that, when any attempt is made to relieve Ethics of its dependence on religion, the old difficulty as to the relation of Virtue to Happiness recurs; but it is no longer in the form of a dispute as to the true nature of the object of rational desire, but rather as the problem of reconciling the desire for one's own Good—good being more or less explicitly understood to be pleasure, enjoyment, satisfaction, agreeable feeling of some kind—with the performance of what reason dictates as Duty. This problem presents itself to most minds as of the very profoundest importance; and I cannot understand how any moralist can turn aside from it, or treat it with indifference. But I quite admit that its solution is not an essential pre-requisite of the construction of a moral code.

On what other principles, then, is this construction to be attempted? It appears to me that on this question there is far more substantial agreement among English moralists than is commonly supposed; and that the fundamental intuitions of conscience or the practical reason on which one school have always laid stress, are merely the expression in different aspects or relations of that ideal subordination of individual impulses to universal ends on which alone Utilitarianism, as a system of ethics, can rationally rest. Thus the essence of Justice or Equity, in so far as it is absolutely obligatory, is that different individuals are not to be treated differently, except on grounds of universal application: which grounds, again, are given in the principle of Rational Benevolence, that sets before each man the good of all others as an object of pursuit no less worthy than his own; while, again, other time-honoured virtues seem to be fitly explained as special manifestations of impartial benevolence under various normal circumstances of human life, or else as habits and dispositions indispensable to the maintenance of rational behaviour under the seductive force of various non-rational impulses. I admit that there are other rules which our common moral sense when first interrogated seems to enunciate as absolutely binding; but I contend that careful and systematic reflection on this very Common Sense, as expressed in the

habitual moral judgments of ordinary men, results in exhibiting the real subordination of these rules to the fundamental principles above given. Then, further, this method of systematising particular virtues and duties receives very strong support from a comparative study of the history of morality; as the variations in the moral code of different societies at different stages correspond, at least generally, to differences in the actual or believed tendencies of certain kinds of conduct to promote the good of society. While, again, the account given by our evolutionists of the pre-historic condition of the moral faculty, which represents it as derived aboriginally from the social instincts, is entirely in harmony with this view. This convergence of several distinct arguments has had, I think, a considerable effect on contemporary thought; and probably a large majority of reflective persons are now prepared to accept 'Common Good' as the ultimate end for which moral rules exist, and the standard by which they are to be co-ordinated and their qualifications and mutual limitations determined.

There remains, no doubt, some difference of view between the converging lines of speculation, as to the whole or community of which the good is to be sought; since from one point of view we should state the end, in Cumberland's phrase, as the "Common Good of Rational or Conscious Beings"; while from another it will be rather the good of the particular race of animals to which we belong. But this difference is easily reduced to latency in the idea of the Good of Humanity, and I do not propose at present to dwell upon it.

But neglecting this, and fixing our attention on the notion of Good, we have to ask whether this is less problematical in the case of humanity generally than Socrates found it to be in the case of the individual man. Have we not, after all, been simply brought round to the point from which ethical speculation started in Europe? If we try to define the Good, how shall we avoid revolving again through the old controversies?

A little reflection will show that we have, at any rate, got rid of one of the competing answers to the old question. We cannot now explain the general Good to consist in general Virtue; that is in the general fulfilment of the prohibitions and prescriptions of Common Sense morality. This would obviously involve us in a logical circle; as we have just settled that the ultimate standard for determining these prohibitions and prescriptions is just this general good.

Thus Pleasure, the other "competitor for the Aristeia," as Plato says, is left without any rival of equally ancient prestige, and in a far better position relatively to ordinary morality. For (1) to regard Virtue merely as a means to the agent's private pleasure

was undoubtedly offensive to the common moral consciousness of mankind. But no similar offence is given by the explanation of the Virtues as various forms and applications of Rational Benevolence, or auxiliary habits (as Courage, Temperance, &c.), necessary to the sustained and effective exercise of Rational Benevolence, amid the various temptations and dangers of human life; while the exercise of Benevolence has always been chiefly understood to mean giving pleasure to others and averting pain from them. And (2) we saw that when Self-love was once clearly distinguished from Conscience, it was naturally understood to mean desire for one's own pleasure; accordingly the interpretation of 'one's own good' which was peculiar in ancient thought to the Cyrenaic and Epicurean heresies, is adopted among the moderns, not only by opponents of independent and intuitive morality from Hobbes to Bentham, but also by the most prominent and approved writers of the Intuitionist School. Indeed, to many of these latter it never seems to have occurred that this notion can have any other interpretation.* If, then, when any one hypothetically concentrates his attention on himself, good is naturally and almost inevitably conceived to be pleasure, it does not appear how the good of any number of human beings, however organised into a community, can be essentially different.

This, then, appears to me to be, in outline, the case for modern Utilitarianism or Universalistic Hedonism, as a study of the history of ethical thought presents it to us. I must now notice briefly the rival doctrines as to the nature of Good which seem to be chiefly maintained at the present time. It appears that Hedonism is attacked from two different points of view, which we may, perhaps, without offence, distinguish as Materialistic and Idealistic; each claiming to substitute an objective standard for the subjective criterion of 'amount of agreeable feeling'. I use 'Materialistic' to denote the view which considers individual men and human societies as Organisms, the condition and functioning of which can be ascertained by external observation, and pronounced good or bad without reference to the series of pleasurable or painful feelings which accompany such functioning. We thus seem to obtain a notion of Well-being or Welfare which may be substituted for Happiness as the ultimate end and standard of right action. Perhaps the notion may be more clearly explained by saying that it is obtained by extending to a race or a community of animals the idea of Health, as commonly attributed to an individual man. In an article in *MIND*, No. I., I mentioned that this view was incidentally adopted by Mr. Darwin in his chapter on the Moral Sense in his *Descent of*

* Cf. Stewart, *Philosophy of the Active and Moral Powers*, B. II., c. 1.

Man; and it seems to have been enthusiastically accepted and more fully developed by some of Mr. Darwin's disciples, among whom I may count Mr. Pollock, who replied to my article in No. III. of this journal. I have studied Mr. Pollock's courteous and carefully written answer, and am still unable to see exactly how he deals with the following dilemma. Either this notion of Well-being is entirely resolvable into 'conditions tending to preservation,' or it includes something more. If the latter be admitted, we have to ask what is this something more which distinguishes well-being from mere being. In one place, Mr. Pollock seems to say that it is something at present undefinable: to which I can only answer, in Aristotle's words, that if we cannot get even a proximate definition of it, we shall be "as archers without a mark, rather unlikely to attain the needful". If, however, he falls back on the former alternative, as certainly other writers of his school seem disposed to do, and says that well-being is merely "Being with the promise of future being," he surely comes into irreconcilable conflict with common sense. I do not wish to exaggerate this conflict. I admit that the most important part of the function of morality consists in maintaining habits and sentiments which seem necessary to the continued existence, in full numbers, of a society of human beings under actual circumstances; and that this part may easily be regarded as the whole, if we consider morality merely as a code of restrictive regulations—the aspect which has been most prominent in modern times. But this maintenance of preservative habits and sentiments surely does not exhaust our ideal of good or desirable human life. We are not content with mere Being, however secured in continuance, for ourselves or for those we love or, in so far as we are philanthropists, for humanity generally. What we demand more, may be expressed by the general notion of Culture; and though some part of what is included in this notion may fairly be interpreted as Preservative Tendencies, there is surely much that cannot possibly be so interpreted. If the Hedonistic view of Culture, as consisting in the development of susceptibilities for refined pleasure of various kinds, be rejected, it must be in favour of what I have called the Idealistic view: in which we regard the ideal objects on the realisation of which our most refined pleasures depend—Knowledge, or Beauty in its different forms, or a certain ideal of human relations (whether thought of as Freedom or otherwise)—as constituting in themselves ultimate Good, apart from the pleasures which depend upon their pursuit and attainment. I do not propose at present to criticise this view, chiefly because I am not acquainted with any philosophical exposition of it sufficiently coherent and systematic

to invite criticism ; though it seems to be pretty widely accepted among cultivated persons, and more or less definitely suggested in the anti-hedonistic arguments of certain philosophical writers. But it may be well to define clearly the manner in which Hedonism, as I conceive it, deals with this view.

The Hedonistic argument against the assumption of 'objective' ultimate ends, just as that against particular moral rules of absolute validity, seems to me to consist necessarily of two parts. It appeals to the immediate intuition of reflective persons ; and secondly to the results of a comprehensive comparison of the ordinary judgments of mankind. The second argument comes in rather by way of confirmation of the first, and obviously cannot be made completely cogent ; since, as above stated, several cultivated persons do habitually judge that certain ideal goods are ends independently of the pleasure derived from them. But we may urge not only that all these ideal goods are productive of pleasure in various ways ; but also that they seem to obtain the commendation of Common Sense, roughly speaking, in proportion to the degree of this productiveness. This seems obviously true of Beauty ; and will hardly be denied in respect of any kind of social ideal, for it is surely paradoxical to maintain that any degree of Freedom, or any form of social order would be desirable even if it tended to impair, instead of promoting, the general happiness. The case of Knowledge is rather more complex ; but certainly Common Sense is most impressed with the value of knowledge, when its 'fruitfulness' has been demonstrated. It is, however, aware that experience has frequently shown how knowledge, long fruitless, may become unexpectedly fruitful, and how light may be shed on one part of the field of knowledge from another apparently remote : and even if any particular branch of scientific pursuit could be shown to be devoid of even this indirect utility, it would still deserve some respect on utilitarian grounds ; both as furnishing to the enquirer the refined and innocent pleasures of curiosity, and because the intellectual disposition which it exhibits and sustains, is likely on the whole to produce fruitful knowledge. Still in cases approximating to this latter, Common Sense is somewhat disposed to complain of the misdirection of valuable effort ; so that the meed of honour commonly paid to Science seems to be graduated, though perhaps unconsciously, by a tolerably exact utilitarian scale. Certainly the moment the legitimacy of any branch of scientific enquiry is seriously disputed, as in the recent case of vivisection, the controversy on both sides is conducted on an avowedly utilitarian basis. Nor does it really make against Hedonism that knowledge and other ideal ends are often most energetically

pursued by persons who do not think of the resulting happiness ; if, as experience seems to show, both the concentration of effort needed for success, and the disposition most favourable to enjoyment, are promoted by this limitation of aim. Nor, finally, need the Hedonist be surprised that the enthusiasm of these pursuits should occasionally prompt to the affirmation that their ends are worthy to be chosen *per se*, even if the pursuits should result in a balance of pain over pleasure. He is only concerned to maintain that, when in a mood of calm reflection we distinguish these ideal objects from the feelings inseparably connected with them, it is the quality of these latter which we see to be the ultimate end of rational desire.

This last proposition I do not find exactly denied, in the terms in which I have stated it ; but an answer is made to it by some writers, which, if valid at all, is certainly conclusive, though indirect. It is said, for example, by Mr. Green* that "pleasure as feeling, in distinction from its conditions which are not feelings, cannot be conceived"; and therefore, of course, cannot be taken as an end of rational action. Whatever plausibility this argument possesses, seems to depend on that ambiguity in the term 'conceive,' which has caused so much confusion in recent philosophical debate. To adopt an old comparison, Mr. Green's proposition is neither more nor less true than the statement that an angle cannot be 'conceived' apart from its sides. That is, we cannot form the notion of an angle without the notion of sides containing it ; but this does not hinder us from apprehending with perfect definiteness the magnitude of any angle as greater, equal, or less than that of any other, without any comparison of the pairs of containing sides. Similarly, we cannot form the notion of any pleasure existing apart from some "conditions which are not feelings"; but we can perfectly well compare a pleasure felt under any given conditions with any other, however otherwise conditioned, and pronounce it equal or unequal ; and we surely require no more than this to enable us to take 'amount of pleasure' as our standard for deciding between alternatives of conduct.

Mr. Green, however has another argument against the 'great-est happiness' doctrine, which it will be desirable briefly to notice ; especially since it also supplies the heavy artillery in an elaborate attack on Hedonism in Mr. Bradley's *Ethical Studies* (noticed in the last number of this journal). I will give it in Mr. Green's words taken from the passage quoted above :—

* I quote this sentence from Mr. Green's Introduction to the Vol. II. of Hume's *Treatise on Human Nature*, p. 9 ; but I have found the same argument used in almost the same words by other writers of the same school. Cf. (e.g.) Prof. Caird in *Academy*, June 12, 1874.

"Happiness 'in its full extent,' as 'the utmost pleasure we are capable of,' is an unreal abstraction, if ever there was one. It is curious that those who are most forward to deny the reality of universals in that sense in which they are the condition of all reality, viz., as relations, should yet, having pronounced these to be mere names, be found ascribing reality to a universal, which cannot, without contradiction, be supposed more than a name. Does this 'happiness in its full extent' mean the 'aggregate of possible enjoyment,' of which modern utilitarians tell us? Such a phrase simply represents the vain attempt to get a definite by addition of indefinites. It has no more meaning than 'the greatest possible quantity of time' would have. Pleasant feelings are not quantities that can be added. Each is over before the next begins, and the man who has been pleased a million times is not really better off—has no more of the supposed chief good in possession—than the man who has only been pleased a thousand times. When we speak of pleasures, then, as forming a possible whole, we cannot mean pleasures as feelings."

We may admit that if any one supposed that his 'greatest happiness' was something that could be possessed all at once, it would be important to explain to him that it was composed of elements which could only be had successively. But I must confess myself quite unable to see how it thereby becomes impossible for him to aim at it. The paradoxical character of Mr. Green's argument cannot be better shown than by taking the very analogy which he selects to enforce it. In what sense is it true that 'greatest possible quantity of time' has no meaning? Since when has it been—not merely wrong but—logically impossible to make prolongation of life an end of voluntary effort? And what is 'length of days,' but 'the greatest possible quantity of time' relatively to the individual looking forward? If it is only meant that we cannot have time by itself, without some filling of time, this is of course true; just as it is true that we cannot have pleasure without the conditions on which it depends. But because Time is an abstraction, it is not therefore unreal, nor incapable of furnishing an end of action; we can aim at living as long as possible, without any regard to the manner of our living; and if we turn out centenarians, we shall commonly be thought to have succeeded in our aim. *A fortiori* we can aim at living as pleasantly as possible, without any regard to the inseparable concomitants of our 'greatest possible happiness.' Mr. Green seems to assume that because the parts of Time, and of whatever has Time for its fundamental form, must exist successively, it is therefore illegitimate to conceive them as parts at all; that a 'happy week,' or a 'miserable month,' is something "which cannot without contradiction be supposed more than a name," merely because we cannot have a happy week all in one moment! Surely this is

as singular a metaphysical whim as ever entered into the head of a scholastic philosopher.

I have selected these two arguments for discussion, because they are of a kind that admits of summary treatment. They are either completely cogent or totally valueless; and it does not require many words to enable the reader to decide which view to take. The case is different with other anti-hedonistic topics, such as the difficulties of estimating the amount of pleasure or pain, comparing the amount of different pleasures, &c. It is, on the one hand, impossible not to allow a certain weight to such objections: on the other hand, they hardly even claim to be decisive; and, in fact, seem rather directed against the practicability of constructing a Hedonistic Calculus, than against the truth of the Hedonistic doctrine as to the nature of Ultimate Good.

H. SIDGWICK.

IV.—KANT'S SPACE AND MODERN MATHEMATICS.

The remarkable modern speculations concerning non-Euclidean sorts of space, of which Prof. Helmholtz gave some account in No. III. of *MIND*, are likely to be hailed as one of the chief difficulties with which the Kantian theory of space will have to deal. "If we can imagine such spaces of other sorts," that learned writer tells us, "it cannot be maintained that the axioms of geometry are necessary consequences of an *a priori* transcendental form of intuition, as Kant thought".

Before attempting to answer this argument, let me briefly point out a fundamental error that appears to hinder many adepts of positive science from realising the true nature of problems belonging to the theory of knowledge, or critical metaphysics.

In our wanderings on the border between science and philosophy we are apt to forget that it is impossible to move on both sides of the boundary line at once, and that whoever crosses it shifts his problem as well as his method. In physics (taking the word in its widest sense) we must adopt a standard of truth, which in philosophy is the very thing to be settled. When a sufficient amount of accurate observation has been digested by correct reasoning, we hold the result to be the adequate expression of real existence. We admit a real world, independent of all appearance to anybody's sense or reason, and take for its exact counterpart the world that offers itself to the *mens sana in corpore sano* after exhausting all the means of research at the command of mankind. Science

has no suspicion of a distinction between 'objectivity' and 'reality'.

Of course the object of science is not altogether the same with that of popular belief. In every-day life we consider as real objects such things as appear to our senses, corrected by reasoning in the rough, as the blue firmament, the earth at rest, &c. In science the real object is what appears to be to the experienced mind attaining the very limit of its powers, and sensible phenomena sink into mere signs of the presence of certain objects. By interpretation of these signs the real object is attained. And if many a theory of the present day will probably be modified by ulterior investigation, still we are moving towards the end of representing the real object as it is.

Yet the real object of science has so much at least in common with that of ordinary life as is wanted for the purposes of measuring and calculation. It retains the space and time, the motion and, to a certain extent, even the matter and force of popular belief. It is not the object of pure thought, evolved from principles presupposed by necessity in every act of thinking, but of thought as applied to data of sense. However simplified by abstraction, it always bears the traces of its sensible origin.

In geometry proper, or constructive geometry (including stereometry), a great many qualities of things are disregarded, while it only attends to the space in which bodies appear to exist and move. But, however shorn of qualities, its object is imagined as something to a certain extent analogous to what we see and touch. Hence its teachings may be assisted by diagrams and models, not mere conventional signs like those of arithmetic or logic. Because it takes from sense-intuition only the very first data, which are the same whatever part of our experience we proceed from, it assumes the aspect of a purely deductive science like arithmetic. Nevertheless its empirical basis may be shown by its inability to construct, for instance, an aggregate of four dimensions. Its real object is that of physics and of common life, considered exclusively as to the metrical proportions of figures imaginable in its space. To demand logical proof for genuine geometrical axioms is a mistake, because every proof must proceed from some ultimate premisses, which in this case must concern space. There are no data about space either in logic or arithmetic, but only in our sense-intuition, and precisely the data expressed in those axioms.

The algebraical geometry of modern science is algebra, a more general form of arithmetic, a series of speculations concerning quantities. Its sole connection with geometry is the understanding that the quantities it considers are meant as

quantities of geometrical data; but this understanding is not embodied in the algebraical symbols themselves. As we learn from Prof. Helmholtz (*l.c.* p. 309), time as well as a line may be regarded here as an aggregate of one dimension, and the system of colours as an aggregate of three dimensions. The formulæ and their analysis remain the same whether the aggregates be assumed to be spatial ones or of a different nature. Hence it is possible to pursue the chain of inference far beyond the limits of any geometrical interpretation, and even, by varying the premisses in which we express certain geometrical data, to prepare formulæ that would apply to spaces foreign to our experience, provided any such could be conceived by the human imagination. The proof in this case is entirely logical: supposing certain relations of quantities, certain other relations must be admitted also, or there would be an end to all our thinking. However, the link between such a system of inferences and its application to qualities of either objective or assumed space is not comprehended in the system itself, but supplied from without, and it remains to be seen how much of the algebraical system will bear translation into geometry.

Now, when we aim at a theory of knowledge and enter into discussion with such thinkers as Berkeley, Hume or Kant, we find ourselves on a ground quite different from that of either physics or geometry. The notions of 'objectivity' and 'reality,' hitherto equivalent, must be carefully kept asunder, or else it becomes impossible even to understand the questions at issue. We must be prepared to examine opinions like these: that there is nothing real except mind, whereas space and bodies are merely its object; or that besides mind there is a reality, impressing it so as to produce an object wholly dissimilar from the reality itself. Again, if admitting impressions from without, we may have to enquire in how far the object is dependent on these and on the constitution of the mind respectively. If it were established beyond all doubt that the 'object' and the 'real' are one and the same, all examination of such questions and theories would become an empty ceremony, and the paradoxes of Idealism absurdities unworthy of our notice. But as things are now, results of scientific research involving that assumption cannot be rightly employed as evidence against philosophical tenets that disclaim its validity.

For a scientific man fresh from physiology of the senses, it is hard to keep in mind that the perceiving, imagining and thinking 'subject' of philosophy is not altogether the same as that with which he had to deal in his former pursuits. There he considered it as a unity of body and mind, one of a class of objects in the world we observe. Here it is nothing more than

the correlative of every object whatever, the observer and thinker opposed to them all. Unaccustomed to this kind of abstraction, the student of nature speedily rounds it off into the full *anthropos* of physiology, not being aware that he has crossed the fatal border; and much of the reasoning current in his own domain is no longer acceptable as lawful tender.

From geometry proper, there is an easy transit into metaphysics, by the road of analytical geometry, which science has but a conventional connection with the data of intuition, and merges into pure arithmetic. In order to determine the relations between construction and analysis, some will attempt to reduce the latter to an abstraction from the sensible object like geometry, while others try to explain the foundations of geometry as necessities of thought unassisted by the senses. Both theories belong to the province of Philosophy; but from the familiar intercourse between mathematics and natural science, it is evident that Science has a great chance of being called in as arbiter and usurping the office without suspicion.

In the present case, the first question is whether any sort of space besides the space of Euclid be capable of being imagined. More than three dimensions, it is allowed, we are quite unable to represent. But we are told of spherical and pseudospherical space, and non-Euclidean exerts all their powers to legitimate these as space by making them imaginable. We do not find that they succeed in this, unless the notion of imaginability be stretched far beyond what Kantians and others understand by the word. To be sure, it is easy to imagine a spherical surface as a construction in Euclid's space; but we vainly attempt to get an intuition of a solid standing in the same relation to that surface as our own solids stand to the plane. A pseudospherical surface we may imagine; but then it is bounded by one or two edges. Nor is it of any avail to draw (as we are told) a piece from the edge back to the middle, and then continue it. This very operation betrays that the continuity of such a surface beyond the edge is not imaginable. We may cloak our perplexity by special phrases, saying that only limited strips of the surface can be "connectedly represented in our space," while it may yet be "thought of as infinitely continued in all directions". The former is just what is commonly understood by being 'imagined,' whereas being 'thought of' does not imply imagination any more than in the case of, say, $\sqrt{-1}$. And when we are assured that Beltrami has rendered relations in pseudospherical space of three dimensions imaginable by a process which substitutes straight lines for curves, planes for curved surfaces, and points on the surface of a finite sphere for

infinitely distant points, we might as well believe that a cone is rendered sufficiently imaginable to a pupil by merely showing its projection upon a plane as a circle or a triangle. Just the characteristic features of the thing we are to imagine must be done away with, and all we are able to grasp with our intuition is a translation of that thing into something else. As to the image in a convex mirror, referred to by Prof. Helmholtz in his article, we do not mentally contrast it with our objective world in Euclidean space, but only with the habitual aspect of that world as seen from a given point of view. In the latter also things appear to contract as they retire to a distance. Only we have learned to conceive the objective space as one in which we ourselves are able to move in all directions and shift our point of view at pleasure. So with some practice we actually see those things not growing smaller, but moving away from the place where we may happen to be. The world in the mirror offers itself as a novel aspect of the same world, needing a larger amount of practice for its interpretation, because complicated by unwonted circumstances. As a form of the objective world, which remains the same from whatever point we inspect it, we can imagine, not any space in which motion implies flattening or change of form of any kind, but only the space known from our sense-experience, the space of Euclid. All other 'space' contrived by human ingenuity may be an aggregate with fictitious properties and a consistent algebraical analysis of its own, but space it is called only by courtesy.

Even admitting for a moment that our mind is capable of *imagining* different sorts of space, it might still be maintained that the only possible form of *actual intuition* for a mind like ours, as affected by real things outside of it, is Euclidean space. When we hold the origin of our geometrical axioms to be empirical, it does not follow that a real space must be assumed as being transported in some way through organs of sense into the percipient mind. Of experience itself there are different explanations, as far as explanations go. Granted that I take my 'flat space' from my perceptions, and these are forced upon me by something not myself, variety of perceptions ought to originate in a variety of outward impulses. But then perception may be, for aught I know, wholly dissimilar in nature from both the impulse and that which produced the impulse, as the perception of red or blue is believed to be the effect of certain undulations in the optic nerve, produced in their turn by the waves termed light, and yet not to be compared with either. Our intuition of space may be empirical without a real space to correspond, provided there be any reality whatever compelling the

mind to exert its native powers in constructing space as we know it, which the mind would not do unless so compelled. In that case space, Euclid's space, would remain a form of intuition, *a priori* and transcendental.

We read that "geometrical axioms must vary according to the kind of space *inhabited*". Why this must be, one cannot understand, unless it be proved first, which is not proved at all, that space as represented by a sentient being is necessarily a copy of a space in which it lives and moves. Even if we suppose that the subject resides in a real space, and that its intuitions of space depend entirely on what it *perceives*, the question remains, how much of its perception is due to the constitution of the subject itself, and how much to impressions from the outer world? Also, what is the relation between those impressions and the spatial arrangement of that world? The space represented on the faith of perception might yet be different from the real space. Nay, on the popular empirical ground taken by physiology, the proposition is a disputable one. Dr. Mises (Prof. Fechner), in one of his witty paradoxes of thirty years ago, reprinted last year in his *Kleine Schriften*, supposed reasoning beings of two dimensions only, like the men we see in the *camera obscura*, who move together with the plane which they inhabit through a third dimension, and perceive that movement only as a continued series of changes in their superficial universe. By analogy he started the hypothesis of a fourth dimension through which we might be moving ourselves. Now we know that analytical geometry is ready to grapple with any number of dimensions,* though they can never be imagined. These plane-people of Mises are quite as imaginable as the sphere-dwellers of Prof. Helmholtz. They would really exist in a space of three dimensions, inhabiting two of them and moving through the third, yet perceiving but two of them as dimensions. So would the sphere-dwellers; for the surface of a sphere means either nothing at all, or the boundary of a solid of three dimensions. Only in their case the third dimension would influence their intuition by preventing them, for instance, from ever gathering experience of parallel lines and geometrical similarity between figures of different size.† However, as our mathematicians succeed in explaining properties of spaces unknown to our experience, even of those of four and

* Cf. the *Ausdehnungslehre* of Hermann Grassmann.

† Unless, indeed, they were small enough to perceive only a very limited portion of their surface, which might easily impress them as flat, as our earth did the first Greek philosophers. We need not stop to inquire whether we ourselves ever get sense-experience of undoubtedly parallel lines. Nevertheless such are constructible out of primary elements supplied by sense-intuition.

more dimensions, there is no reason to deny the same faculty to our imaginary surface-men. As all straightest lines on a sphere end by meeting somewhere, why should they not for once suppose a different surface, on which straightest lines might be drawn in any direction so as to retain the same distance to infinity, and, reasoning on this and a few more suppositions, discover the analytical geometry of the plane? Combining this with their original spherical theorems, some genius among them might conceive the bold hypothesis of a third dimension, and demonstrate that actual observations are perfectly explained by it. Henceforth there would be a double set of geometrical axioms; one the same as ours, belonging to science, and another resulting from experience in a spherical surface only, belonging to daily life. The latter would express the 'object' of sense-intuition; the former, 'reality,' incapable of being represented in empirical space, but perfectly capable of being thought of and admitted by the learned as real, albeit different from the space inhabited.

The 'rigidity' ascribed to geometrical figures is hardly to be considered as a physical quality. A physical solid, say an india-rubber ball, may be thought of as being flattened to a spheroid or a disc, and still retain its identity, because the matter remains the same. It would be perfectly rigid in a physical sense, if its form were unchangeable by any external force whatever. But a geometrical sphere is the same only as long as both its form and size remain what they are. The rigidity is not resistance against force, but simple identity with itself. We might conceive a spheroid of the same volume, and an unbroken series of spheroids between it and the sphere; so by analogy with the physical body we might say that the sphere was gradually flattened to the ultimate form in the series. Still in the geometrical sense there would be no identity between the sphere and any of the spheroids, because here matter is wanting, but only a successive substitution of something else instead of the primitive figure. If we apply one sphere to another, and find out their congruence or the reverse, the meaning is not that a physically rigid body is to be transported through all the intervening parts of space. The purpose is answered as well by mentally cancelling the old sphere, and constructing a new one on the same principle and with the same radius, so that its centre coincide with that of the sphere to be compared with it. In the case of mechanical science deciding that two bodies must have varied in the same sense during such an operation, the inference would be that the consequences of geometrical application of figures to each other can never be verified by actual experience on physical bodies for that reason, to say

nothing of their impenetrability. But geometry would declare bodies liable to vary, to be different from its own solids. Of course, its own abstract notions of space and figure may be supplemented at pleasure by taking into account time of movement, or a concept of matter just sufficient to distinguish a filled part of space from an empty one. In the former case we come to phronomy, in the latter to mixed geometrical speculations about bodies capable of contractions and distensions. Such speculations are as lawful as what most people understand by geometry, and it appears that physicists find them useful for their ulterior purposes. Only they must not be confounded with the doctrine of space and its measures, in which a solid is simply a part of space of a certain form and size, a surface the boundary between such parts and so on. These parts of space it would be absurd to consider as changeable, whatever experience may affirm concerning physical bodies that move in space. It is certainly true in one sense, that the axioms of geometry "merely define what qualities and deportment a body must have to be recognised as rigid". But this regards geometry as applicable to bodies or material things; its own solids are not meant either to have or to lack physical rigidity.

Nevertheless geometrical axioms are synthetic propositions, because they are not to be deduced by pure logic from the definition of their subject-terms, but are found by intuition of the space offered to us as a form of our objective world. As far as we know, that world and its space could be quite different from what they are, were it not for sense-experience which supplies the first elements of construction, and reflection which constructs figures and examines them as if actually seen. The axioms of geometry proper are discoveries resulting from the contemplation of objective space by itself; as soon as we add the empirical elements of movement, properly so called, of bodies filling space, &c., we stand upon another ground.

To conclude these observations, the Kantian theory of space, as defined by Prof. Helmholtz himself, contains three distinct assertions:—

(a.) Space is a form of *intuition*: any conception of ours must be imaginable to be what we call space. [This is admitted by the opponents; only non-Euclideans try to make imaginable that which is not so in the sense required for argumentation in this case.]

(b.) Space is a form *a priori*: a native form of our perceptive faculty, not a datum passively received from without. [The opponents attempt to refute this by proving the empirical origin of our notions of space. Between this proof and the refutation

of Kant's assertion there is wanting the proof that empirical knowledge is acquired by simple importation or by counterfeit, and not by peculiar operations of the mind solicited by varied impulses from an unknown reality.]

(c.) Space is a *transcendental* form: belonging to our own object by some necessity arising from the unknown constitution of our mind; but not therefore belonging to the real world as well. [The opponents overlook the distinction between 'objectivity' and 'reality,' and reason, as they would do in physical science, on the tacit supposition of the two being identical, and Kant's assertion disproved beforehand.]

After this, the final propositions of the article in question would have to be modified as follows:—

(1.) The axioms of geometry, taken by themselves out of all connection with mechanical propositions, represent no relations of physical objects. When strictly isolated, if we regard them with Kant as forms of intuition transcendently given, they contribute a form into which any empirical content whatever will fit, and which therefore does not in any way limit or determine beforehand the nature of that content. In other words, axioms concerning parts of space do not determine the deportment of bodies filling such parts at a given moment. We may admit that this would hold true if the axioms given were those of spherical or pseudospherical geometry; however, the (possibly transcendental) form of intuition actually given is that analysed in Euclid's axioms.

(2.) As soon as certain principles of mechanics are conjoined with the axioms of geometry, we obtain a system of propositions which has full objective or physical import, and which can be verified or overturned by fresh sense-observations, as from sense-experience it can be inferred. If such a system were to be taken as a transcendental form of intuition and thought, there must be assumed a constancy of laws determining the relations between the mind's objects and the impulses which it receives from an unknown reality.

J. P. N. LAND.

LEYDEN, *Sept. 30, 1876.*

V.—FUNDAMENTAL LOGIC.

AT least three distinct views are possible of the relation between logic and mathematics. Mathematics may be regarded as a special application of logic; or logic may be regarded as a branch of mathematics*; or the two may be regarded as co-ordinate sciences.

I regard the ordinary logic as a co-ordinate science with mathematics: but I further maintain that the ordinary logic on the one hand, and mathematics on the other, are two separate developments of a simpler logic than any which has been usually recognised.

It appears to be admitted by all, that the fundamental relation in mathematics is equality; and it appears to be generally thought that the fundamental relation corresponding to this in the ordinary logic is identity. I dispute this latter position. I maintain that the fundamental relation of the ordinary logic is not identity, but co-existence. But mathematics, or the logic of equality, and the ordinary logic, or the logic of co-existence, both rest on the simplest and most elementary logic, which is that of identity.

John Stuart Mill is the only writer known to me who has clearly seen that the ordinary logic rests not on identity but on co-existence. His system is, in substance, an application of the principles of the ordinary logic to the actual work of discovery and proof; and, seeing that the axioms of identity and contradiction are by themselves able to carry the reasoner but a little way, he proposes as the canon of his logic the axiom that "things which co-exist with the same thing co-exist with each other". His treatment of formal logic is, however, unsatisfactory, or at least incomplete, and I must say a few words in defence of the position that the syllogistic reasoning of the ordinary logic really depends on this axiom.

The relations with which the ordinary logic deals are those of the inclusion of one class in another, and of individuals in classes; and when it is reconstructed by treating propositions as equations, the relations with which it deals are those of the total or partial identity of classes.

For my present purpose it will be best to instance a case of

* Mr. Venn, in his very lucid exposition of Boole's Logical System in MIND No. IV., says (p. 480):—"The prevalent notion about Boole probably is, that he regarded Logic as a branch of Mathematics; that, in fact, he simply applied mathematical rules to logical problems. This is a very natural mistake." If it is a mistake, Boole is himself answerable for it. The full-length title of his great work is *An Investigation of the Laws of Thought, on which are founded the mathematical theories of Logic and Probabilities*.

total identity. In the ordinary logic, as modified by 'quantifying the predicate,' the following would be regarded as a proposition of total identity:—"The things having inertia are the same as the things having gravity." But it may be much better stated as a proposition of co-existence, thus:—"Inertia and gravity always co-exist." I do not lay any stress on the evident truth that the latter mode of expression appears much more natural; but I say that the proposition, though it may with perfect accuracy be stated as one of identity, is essentially and primarily one of co-existence. Inertia is in no sense identical with gravity.

All propositions asserting the inclusion of one class within another, may in like manner be shown to be really propositions asserting co-existence. Thus the proposition, "Chlorine is an imperfect gas," according to the view of the ordinary logic, asserts that "The species chlorine is included in the class of imperfect gases". But if we make no postulate as to the existence of such a class, and state the proposition in its utmost possible simplicity, it becomes the following:—"With the differentia of chlorine (consisting in its colour and its chemical reactions) the (physical) properties of an imperfect gas co-exist."

In Boole's and Jevons's logical systems, propositions are written as mathematical equations, and the co-existence of qualities is symbolised by the combination of terms. If we call inertia x and gravity y , the identity of the things having inertia and those having gravity is asserted by the equation, $x = y$: but if we interpret x and y to mean, not the things having the qualities, but the qualities themselves, then the copula $=$ will mean not identity but co-existence, and the equation will assert the invariable co-existence of the qualities.

In Jevons's notation,* which for its purpose appears absolutely perfect, if x means chlorine and y an imperfect gas, then the equation $x = xy$ asserts that chlorine is an imperfect gas. If, further, z means freely soluble in water, the equation $y = yz$ asserts that imperfect gases are freely soluble in water; and the syllogism whereby, from these two premisses, we infer that chlorine is freely soluble in water, is expressed as follows:— $x = xy$; $y = yz$; therefore, $x = xyz = xz$.

Boole appears to recognise the existence of no simpler logic than that of co-existence, for he begins his system by stating the laws of the combination of terms. He uses 1 as the symbol for "all," and $1 - x$ is consequently his expression for whatever is

* See his *Principles of Science*. Jevons, however, uses the capitals A, B, and C, where I follow Boole in using the small italics x , y , and z . I prefer to make logical equations look as like mathematical ones as possible.

not- x . In logic, as in mathematics, the equation $1x = x$ is thus true of all values of x . He places at the commencement of his system the two following equations, which are his expressions of the laws of identity and contradiction: $x^2 = x$, and $x(1 - x) = 0$. The first of these asserts that, if a term be combined with itself, the result is the same as if it remained uncombined:—thus, “heavy, heavy things” are the same as “heavy things”. The second asserts that a term and its negative cannot be combined:—thus, things which are at once heavy and not heavy cannot exist. These two equations, which in logic are true of all terms whatever, are in mathematics true only of terms having the values of 1 and 0.

Boole (*Laws of Thought*, pp. 49, 50) calls attention to the fact, that these equations, expressing the fundamental laws of thought, are equations of the second degree. This is so surprising a result, that it ought to excite a suspicion, not indeed of the accuracy of Boole's expression of these laws, but of the truth of the assumption that they are what is simplest and most elementary in logic. I maintain that there is a more elementary logic than Boole's: a logic in which there are no combined terms, and consequently no equations except those of the first degree; no operations except addition and subtraction; no interpretation of the copula except simple identity; and of which the axioms are true not only in logic but in mathematics.

In what follows I must request the reader to bear in mind that the word identity is used in the sense not only of total but of partial identity, so as to include the relation of a part to the whole.

When expressed in language, the propositions and syllogisms of the logic of identity are similar in form to those of the old logic. The old logic deals chiefly with such cases as the inclusion of class within class; but the same or similar forms will express the inclusion of a part in the whole, or of a constituent in the compound. The following are examples:—“The anther is a part of the flower; the flower is a part of the tree; therefore, the anther is a part of the tree.” “Hydrogen is a constituent of water; water is a constituent of albumen; therefore, hydrogen is a constituent of albumen.” It may be thought that the distinction between propositions of co-existence and of identity is one of interpretation only, and does not belong to formal logic; and in fact this distinction, so far as I am aware, has not been seen till now;—the purpose of this paper is to insist on it. In proof of the really logical nature of the distinction, it is to be observed that, though propositions of co-existence may no doubt be stated as propositions of identity, the converse is not true—propositions of identity cannot be stated as propo-

sitions of co-existence. The two syllogisms last stated have propositions of partial identity for their premisses and their conclusions, and none of these can be stated as propositions of co-existence; and the forms of proposition and syllogism by which, as we have seen, Jevons so admirably expresses the logic of co-existence, cannot, without an unwarrantable strain on their meaning, be made to express the logic of simple identity.

There is another peculiarity of the logic of co-existence which confirms me in the belief that it is fundamentally distinct from that of mere identity. Sir William Hamilton has shown, though I believe he was not the first to discover, the double interpretation, in extension and in comprehension (or intension), which the terms of the ordinary logic admit of. The extension and the comprehension of the meaning of terms, or, in other words, the denotation and the connotation of class-names, vary inversely as each other—that is to say, the number of species included in a class is greater as the number of attributes connoted by the name of the class is less. Thus, if the syllogism above-stated respecting chlorine is interpreted in extension, its meaning will be:—"Chlorine is one of the class of imperfect gases; imperfect gases are part of the class of substances freely soluble in water; therefore, chlorine is one of the class of substances freely soluble in water." But if interpreted in comprehension, its meaning will be:—"The properties of chlorine include those of imperfect gases; the properties of imperfect gases include those of substances freely soluble in water; therefore, the properties of chlorine include those of substances freely soluble in water."

When we interpret terms and propositions in comprehension, we are really treating them as belonging to the logic of co-existence; when we interpret them in extension, we are treating them as belonging to the logic of identity.

Now, in the logic of identity, no interpretation in comprehension is possible; its terms and propositions are interpretable in extension only. This will be made evident by referring to either of the two syllogisms already given as examples of that logic.

Moreover, in propositions asserting the inclusion of class within class, which I regard as really propositions of co-existence, we have seen that the more species a name denotes, the fewer attributes it connotes. But this is reversed in propositions asserting the inclusion of a part in the whole, which I regard as really propositions of mere identity;—the name of the whole connotes more attributes than the name of the part. The tree has a greater variety of attributes than the anther, and the compound than the element.

The distinctness of the logic of co-existence from that of identity seems to be proved by these two closely-connected facts, that propositions of co-existence may be stated as propositions of identity, but not the converse; and that propositions of co-existence may be interpreted either in extension or in comprehension, but propositions of identity can be interpreted in extension only.

It has not, I think, been sufficiently noticed, that propositions are possible respecting a class which do not make any assertion respecting the members of the class. For instance:—Insects are the largest class of animals—Birds are the most sharply defined class of animals.

The laws of identity and contradiction are fundamental in logic, and, so far as they can be expressed without combined terms, they may be expressed by the equations $x = x$; and $x - x = 0$. To these it has been usual to add, as a third and co-ordinate law, that of excluded middle, or, to use Jevons's much better phrase, the law of duality. This law, as generally stated, is that every thing must either possess or not possess any given property; but this statement belongs to the logic of co-existence; in the logic of identity its statement is, that any total of which x is a part consists of the sum of x and not- x ; and, 1 being the symbol for "all," it may be expressed by the equation $1 = x + (1 - x)$. When thus stated, it is seen to be not a co-ordinate law with the two preceding, but a corollary from them. This, I think, agrees with Boole's view.

There are, however, two other laws which appear to be co-ordinate axioms with those of identity and contradiction. One is that two negatives form an affirmative or positive:—this law may be expressed by the equation $-(-x) = x$, or what is perhaps a better expression, as not suggesting that a negative term can have any independent meaning, $x - (y - z) = x - y + z$. The other is the law that the order in which addition takes place is indifferent:—it may be expressed by the equation $(x + y) + z = (y + z) + x$. This is the form of the equations of chemical transformation, as will be seen if y is taken to mean oxygen and x and z two oxidisable substances. Such equations really belong to the logic of identity, assuming, however, the physical truths that matter can neither be created nor destroyed, and that every compound may be resolved back into its elements.

Perhaps we ought to enumerate yet another law, to the effect that an equation may be read either way, so that, if $x = y$, it is equally true that $y = x$. It is not unlikely, however, that the statement here made of the laws of the logic of identity may be found to admit of improvement.

It will be observed that all these laws are true, not only in the logic of identity, but also in the logic of co-existence and of equality, that is to say in the ordinary logic and in mathematics.

It is worth while to show that a complete though very simple symbolic method is possible in the logic of identity, without any combination of terms, and with no operations except addition and subtraction.

I propose to express the proposition "all x is y ," or " x is a part of y ," by the equation $x = y - p$, p being so much of y as is not x :—and the parallel expression for "no x is y " is $x = (1 - y) - p = 1 - y - p$.

We will speak first of conversion. The problem of logical conversion may be thus stated in its utmost possible generality:—Having described x in terms of y , to describe y in terms of x . The affirmative proposition "all x is y ," or $x = y - p$, is converted by simply transposing p , when it becomes $x + p = y$. The negative proposition, "no x is y ," or $x = 1 - y - p$, is converted by subtracting both sides of the equation from unity and transposing p , when we get $1 - x - p = y$.

The forms of syllogism may be expressed with equal facility. An ordinary syllogism will read thus: $x = y - p$; $y = z - q$; therefore, $x = z - q - p$: or, by transposing p and q , $x + p = y$; $y + q = z$; therefore, $x + p + q = z$.

If we assign to these symbols the same meaning that we assigned when speaking of interpretation in comprehension, this syllogism will mean, "Chlorine is one of the class of imperfect gases; imperfect gases are part of the class of substances freely soluble in water; therefore, chlorine is one of the class of substances freely soluble in water":—

Chlorine	$= x = x$
Imperfect gases	$= y = x + p$.
Substances freely soluble in water	$= z = x + p + q$.

But if we interpret the same syllogism in comprehension, and use Jevons's notation accordingly, as explained above, then

Chlorine	$= x = xyz$
Imperfect gases	$= y = yz$
Substances freely soluble in water	$= z = z$

The increasing number of letters in the one notation shows the increased magnitude of the classes, while the decreasing number of letters in the other shows the decreased number of attributes in their description:—thus, we may almost say, showing to the eye how extension and comprehension vary inversely as each other.

We have now to see how the transition is made from the logic of identity to the ordinary logic and to mathematics.

A glance at the algebraic form of syllogism given above for the logic of identity, will show its canon to be that things identical with the same thing are identical with each other: or, in other words, that identical terms may be substituted for each other. This is not a distinct axiom, but an immediate corollary of the principle of identity. The axioms that things which are equal to the same thing are equal to each other, and that things which co-exist with the same thing co-exist with each other, are also corollaries from the same. In order to make this clear, we have to state the following definitions:—(1) *Similar* are things concerning which the same predications can be made; in other words, *similar* are things whereof the symbols may be substituted for each other.* (2) *Equality* is similarity of magnitude. (3) *Co-existence* is identity of position either in space or in time.

From these definitions, the truth of the reasoning $x = y$; $y = z$; therefore, $x = z$, follows without any other axiom being needed than that of identity; and this is equally true, whether the copula = is taken to mean identity, co-existence, or equality. The only distinction between the subject-matter of logic and that of mathematics appears to be that the copula, which in mathematics means equality, in logic means either identity or co-existence.

In the notation which I have proposed for the logic of identity, we have seen that there are no operations except addition and subtraction, and these have exactly the same meaning as in mathematics. But in the logic of co-existence there is another operation on the symbols, namely combination, symbolising the co-existence of qualities, to which there is nothing in mathematics precisely analogous. This appears to support the view that the logic of identity is the fundamental logic.

The following are the principal points which I have endeavoured to bring out in this paper.

The ordinary logic is not primarily a logic of identity, but of co-existence; but the logic of co-existence and mathematics, which is the logic of equality, rest on a more elementary logic of identity.

In this logic there is no combination of terms, and no operation except addition and subtraction.

The axioms of this logic are true also in the logic of co-existence and in mathematics. The fundamental axioms of Boole's logic of co-existence, $x^2 = x$, and $x(1-x) = 0$, are on

* See Jevons's *Substitution of Similar*. He states the definition, however, as an axiom, that "what is true of a thing is true of its like".

the contrary inapplicable to the logic of identity, and are not generally true in mathematics.

Propositions of co-existence may be reduced to the form of propositions of identity, but the converse is not true.

The terms and propositions of the logic of co-existence may be interpreted in either extension or comprehension, but those of the logic of identity in extension only.

I have, in conclusion, to make a few remarks on the "logic of relatives". This will probably be found to be an extension of the logic of co-existence. The combination of logical terms, symbolising co-existence, is analogous, though not closely so, to the combination of mathematical terms, symbolising multiplication; at least such an analogy is implied throughout Boole's system. It will probably be found that the relation of x to y in logic may be appropriately symbolised by $\frac{x}{y}$; and that relation in logic is to ratio in mathematics, what co-existence in logic is to multiplication in mathematics.

We have seen that in Boole's system 1 is the symbol for "all," or "universe"; so that the equation $1x = x$ is true in logic, as in mathematics, for all values of x . The equation $\frac{x}{1} = x$ is also true in mathematics for all values of x . Is it so in logic? and if so, what is its interpretation? I venture to suggest that it is true in logic, and that it is the logical expression of the truth of the relativity of knowledge—that is to say, as I understand it, the truth that only relations can be the objects of knowledge. If relation in logic is analogous to ratio in mathematics, the expression $\frac{x}{1}$ means the relation of x to the universe, and the equation in question means that, for all purposes of knowledge, a thing is identical with its relation to the universe; including, as part of the universe, the mind which knows the relation.

Another indication of the same or a kindred truth is afforded by the fact, that the same symbol may either be interpreted in comprehension to mean a quality, or in extension to mean the things having the quality. This may be regarded as an expression of the truth, that for all purposes of knowledge a thing is identical with the sum total of its qualities.

I make these suggestions with much diffidence, and the more so because I am inclined to dread mixing up metaphysics with logic; nevertheless, I think them worth making.

It will be perceived that I adhere to the doctrine of the "quantification of the predicate"; and I have to add, that I

regard the science of logic as primarily conversant neither with names nor with concepts, but with things. This view of the subject of logical science is the justification I offer for what will to some appear an illegitimate treatment of the inclusion of a part in the whole as a similar though not identical case to the inclusion of a species in the class.

It is in my opinion a profound error to think that logic depends on psychology. It is a misleading expression to call the laws of logic the laws of thought. No doubt they are so, but only in the same sense in which any truths whereof the contrary is unthinkable may be called laws of thought. The laws of logic, unlike the laws of the association of ideas, do not depend on the structure of the mind—they are laws of thought because they are laws of the universe.

JOSEPH JOHN MURPHY.

VI.—LORD AMBERLEY'S METAPHYSICS.*

THE only portion of the late Lord Amberley's *Analysis of Religious Belief* which is of special interest to the student of philosophy, is the Second Book, which treats of "The Religious Sentiment Itself". This occupies little more than a hundred pages of the thousand or so of which the work is composed; and all that is of peculiar value in it might have been compressed within narrower limits. A few pages will be sufficient to show what it amounts to, and what is its significance for us at the present time. I do not express any opinion upon the value of his collection of data. It is sufficiently complete to supply a basis for the analysis of the religious sentiment into its "ultimate elements," though it may be that it was scarcely needed for that purpose. The "ultimate elements" which Lord Amberley finds are the components of the religious sentiment may be discovered by every individual for himself, if he will only question his consciousness when turned upon religion.

Lord Amberley, as the result of his elaborate investigations, finds that all religions have certain features in common. They are all concerned with consecrated actions and consecrated places, and nearly all have to do with consecrated persons and a consecrated class. These are assumed to be the means, or media, through which man communicates with God. But as religions also imply that God addresses man, there are means

* *An Analysis of Religious Belief*, by Viscount AMBERLEY, 2 vols., 1876. Trübner & Co.

of communication "downwards" as well as "upwards"; and the Deity makes Himself known by means of holy events, holy places, holy objects, a holy class (who perform the ceremonies of religion with peculiar efficacy), holy men (who have authority to teach infallible truth), and holy books, written by persons inspired to write as He desires them to do. Now, although the fact that rival religions exhibit the same phenomena may be used as an argument to prove that they are all false equally, since they may be said to cancel each other, yet comparative religion suggests to us another procedure. Since everywhere, at all times, there is the manifestation, under however great variety of forms, of the religious sentiment, must there not be an element of truth in what is thus the universal possession of man? Is there, amid the variety of religions, any universal faith? and if there be, does it indicate any objective reality corresponding with itself, or is it merely a phantom—the play of our misleading imaginations? This is the philosophical question Lord Amberley deals with. He finds three fundamental postulates in the religious idea:—"First, that of a hyperphysical power in the universe; secondly, that of a hyperphysical entity in man; thirdly, that of a relation between the two," or, expressed in other terms, the objective and the subjective elements in religion, and their co-relation; and he examines these to ascertain whether they are "a necessary and therefore permanent portion of our mental furniture," and, if they are, whether we must conclude that they indicate more than their existence in the human mind—whether they point to a reality which is outside and independent of man.

So far as we have gone, there seems no necessity in analysing the religious idea for any wide induction of religious phenomena; for the idea is present to every one. The foundations so laboriously dug by Lord Amberley are certainly not essential as a propædæutic to an analysis of the religious idea into the ultimate elements of an objective cosmic cause, a subjective spiritual entity, and the co-relation of these two factors. There is a great work waiting to be done in comparative religion, and Lord Amberley's example may prove useful in leading the way; but if it is to accomplish anything of importance, it must be undertaken for wider ends than to furnish the materials for an analysis that may be as effectively performed without them. Under "The Objective Element," indeed, Lord Amberley recapitulates what he had said in the body of the work regarding the conceptions of Deity entertained by different races at different periods, and finds that, with the lapse of time and the progress of the human race, man's conception of God has become more spiritual and more humane. This fact, which is

testified to by the history of Christianity in the idea of the successive ages or dispensations of the three Persons of the Trinity, might have supplied food for reflection; but all Lord Amberley takes out of his historical survey is—"that religion everywhere contains, as its most essential ingredient, the conception of an unknown power". This power is not perceived by the senses, nor can its nature be defined by the intellect, which only acts through comparison and classification; must we then accept it as a real existence, or is it a figment of the human brain?

To help in answering this question, which raises the point of the validity of our mental deliverances, Lord Amberley enters on a brief examination of the various theories of the universe, held by different classes of thinkers. Without the conception of some power as an objective reality, it is hard to see how there can be any consistent and stable idea of anything. The various points of view may be generally classified as Realism and Idealism, and the former may be distinguished into Crude and Metaphysical Realism, whilst we divide the latter into Moderate and Extreme Idealism. Lord Amberley accepts entirely no one of these views, but attributes to each of them a certain element of truth. The outcome of his examination is that there is an unknown Power, Origin, or Cause, external to us—the same conclusion as we are shut up to in dealing with Religion. "Philosophy or Reasoned Thought," says Lord Amberley, "and Science or Reasoned Observation, have both led us to admit, as a fundamental principle, the necessary existence of an unknown, inconceivable, and omnipresent Power, whose operations are ever in progress before our eyes, but whose nature is, and can never cease to be, an impenetrable mystery. And this is the cardinal truth of all religion. From all sides, then, by every mode of contemplation, we are forced upon the same irresistible conclusion." Of course we have not transcended the subjective sphere; for we have only found that the belief in this objective cause is necessary to us—that is to say, that we cannot help believing it; and if our minds are records of stages of illusion (as Von Hartmann has maintained), it may have none but this subjective existence. Lord Amberley will not listen to this conclusion. He believes in the objective reality of what is subjectively affirmed to be necessary, and he does so on the old grounds held by those who tested necessary truths by their necessity and universality. He claims that the fundamental postulate of religion is true, because wherever human intelligence has reached the stage above the lowest savagery, it always does, and cannot but (owing to the conditions of thought) take possession of the mind; and that whenever it has done

so, it retains its place for ever. "It persists, in spite of every attempt to do without it, and the highest philosophy is compelled to give it the place of honour in the forefront of its teaching." But all words or terms by which we seek to designate this ultimate reality are only symbols, and though with the progress of the human race the symbolism has become more comprehensive, it remains symbolism still.

"Name ist Schall und Rauch,
Umnebelnd Himmelsgluth."

"All that we can say is, that while we *know* nothing but that which our senses perceive or our minds understand, we *feel* that there is something more. Both the world without and the world within, both that which is perceived and that which perceives, require an origin beyond themselves. Both compel us to look, as their common source, to a Being alike unknown and unknowable, whose nature is shrouded in a mystery no eye can pierce, and no intellect can fathom."*

Lord Amberley deals cursorily with the subjective element. He shows the universality of the belief in an entity in man, which, though working through, is distinct from, his body, and then, in a brief analysis, suggests the impossibility of resolving the phenomena of consciousness into matter or terms of heat or motion. The gulf between that which feels, perceives, thinks and reasons, and that which is felt, perceived and reasoned on, is so great that no community of nature between them has been, or probably can be, discovered. Whether or not the distinction between them is ultimate in the nature of things, it is ultimate in the order of thought and in reference to us. What, then, of the relations between the unknowable cause and the unknown entity we call consciousness? As the religious sentiment in the mind of man perceives its object, the Ultimate Being, so that Being is conceived as making itself known to the mind of man through the religious sentiment. A reciprocal relation is thus established; the Unknowable causing a peculiar intuition, the mind of man receiving it. "And this," says Lord Amberley, "is the grain of fact at the foundation of the numerous statements of religious men that they have felt themselves inspired

* Those who are curious in such matters may be interested at seeing an analogous view put in similar words by David Hume. In the *Dialogues concerning Natural Religion*, Hume puts into the mouth of Demea these words:—"The question is not concerning the Being, but the Nature of God," which is "altogether incomprehensible and unknown to us". The essence, attributes, manner of existence, and nature of duration of the Supreme "are covered in a deep cloud from human curiosity; it is profaneness to attempt penetrating through these sacred obscurities. And next to the impiety of denying his existence, is the temerity of prying into his nature and essence, decrees and attributes."

by God, that He speaks to them and speaks through them, that they enter into communion with Him in prayer, and obey His influence during their lives." These feelings are not all illusion, however fanciful and unreal the forms they mostly assume. There is a real communion between the objective ultimate and the subjective ultimate, for the latter is the medium through which the former acts. Further, our analysis of perception—whatever the theory to which it leads us—leaves us with consciousness as the one reality directly and indirectly known by us to exist, and nothing is conceivable as existent except under the conditions of consciousness. It is impossible for us to conceive existence except as co-relative to some consciousness; and this consideration leads Lord Amberley to the further inference that our affirmation of the existence of the unknown cause implies that it is akin to consciousness, since consciousness is "the ultimate substance of the mind, from which alone our conception of absolute existence is derived". Therefore the two Ultimates are in some unknown sense alike, though the likeness cannot consist in any analogy to those thoughts, feelings, and conscious moods which in man are constantly flitting and varying. It must have a deeper root beyond our ken; and the Unknown Cause which is thus near and like to us, must include our consciousness as the source from which that has come; for we cannot think of two ultimate causes—one of nature, and the other of thought—one of the outer, and the other of the inner world. We are, then, as produced by or emanating from the universal fount of being, in the relation to it of a part to the whole; and in it we live, and move, and have our being. Consequently in all our actions, even when we deem ourselves to be most free, we are the agents of the Universal Cause. We feel as if we were reservoirs of individual force; but the force is not ours but its, and our conditional and qualified independence does not therefore contradict the great scientific law of the persistence of force, since all things are rooted in the one universal force. The distinction between mind and matter, feeling or thought, and that which is felt or thought about, though real and to our consciousness absolute, is not absolute in the nature of things, seeing that all things are one in the Ultimate Being, and there is "one law, one faith, one element," while all things are moving towards "one far off divine event". There is no real distinction between the universal life manifested in the inanimate forces of our system, and the fragmentary life which comes to light in animated creatures. All things are one, and all things are the same. All things have been and are being educed in the majestic order of universal evolution, and we are able to see how it is that we

cannot comprehend that of which we are parts ; " for the part cannot comprehend the whole—it can only feel that there is a whole ".

The God which (who?) is thus the object of worship for religion, as of acceptance by the philosopher, is not, it is scarcely necessary to say, a personal being. Lord Amberley is as candid on this point as upon others. The "dim figure of an inconceivable and all-embracing ultimate existence" is not reconcilable with the idea of either the abstract Divinity of the pure Deist, or the self-communicative Divinity worshipped by Christians as the Three in One. Consequently to Lord Amberley, Father, Son, and Holy Ghost represent successive stages of illusion through which the human mind has passed. To him, the impersonal is the highest ; for all efforts to represent God as a person he declares to be mere "hankerings after an incarnation of an idea which does not by its nature admit of representation by incarnate forms". Religion, however, he contends, does not lose its object because it becomes an unknown and unknowable Power, or Force, or Cause, or however we may name it. On the contrary, instead of being fitful and occasional, Religion is found to be in everything and everywhere. Men are always, and not at merely exceptional times, the agents and organs of the mighty soul of the universe, and religion "becomes a calm, all-pervading sentiment, shown (if it be shown at all) in the general beauty and spirituality of the character, not in the stated exercises of a rigorous piety, or in the passionate outbursts of an enthusiastic fervour". With the loss of a personal God, we also lose the faith in an individual immortality, in resigning which Lord Amberley is forced to admit he surrenders "a balm for the wounded spirit, for which it would be hard to find an equivalent in all the repertories of science, and in all the treasures of philosophy". Progress from a lower to a higher stage, however, (he says) necessarily involves loss ; and if we are deprived of the hope of rejoining those who have gone before us, when life's fitful fever is over, we find in the very fact that our all of life is here incentives to duty, and motives to ever-deepening sympathy with our fellow-men, which point onwards to the brighter time when to minister to humanity shall be the glad service of all, and when the consolations of the new religion will surpass in strength and perfection all those offered by the old. Pious resignation to whatever comes, helpful alacrity in doing all duty in the present for the sake of our brethren of mankind, calm, self-confident, because fearless facing of the future where all must be well, seeing that progress is the law of life—these are some of the consolations, as they are the fruits, of the new faith, which claims to

have a scientific basis and to be able to justify itself against sceptics and cavillers, because it only aims at making men wiser and better, more courageous and more enlightened.

In reflecting upon the outcome of Lord Amberley's metaphysics, it becomes plain that there is a good deal more in it than has a right to be there. His Absolute, which is the source whence all things have come, and the fount to which presumably they return after the process of evolution is completed, is akin to, but is not, and has not, consciousness. Either, then, this Absolute is not the highest of existences, since it is non-conscious; or consciousness is not the highest mode of being. We have seen, however, that Lord Amberley felt under irresistible compulsion to treat consciousness as "the one reality which is known to exist"; and in consequence to attribute some sort of vague kinship with consciousness to his Absolute. But vagueness here can least of all be permitted. Personality is the nerve of consciousness, the indispensable and essential constituent and co-relative of thought. Existence is only conceivable in connection with the antithesis of subject and object which is the root-form of consciousness. It is idle to talk of the "substance of consciousness" as if it were something different from consciousness itself—a kind of substratum in which that inheres. We know the substance, and it is consciousness—we cannot transcend this ultimate, which is to us the measure of all things, while itself is measured by none. If all explanation be translation into terms of thought, the only Absolute we can think of, or attribute existence to, is God as Absolute Ego—the nature of whose personality is inconceivable by us, but who must be the source of thought, of consciousness, and whose inclusion of all thought within His own being does not exclude the consciousness of Himself. It is impossible for us to give any definiteness to that feeling of a universal presence which religion supplies, unless we attribute to it (whatever more it has) the highest thought by which alone we are able to construe existence. Feeling or sensation is our ultimate, so far as we are affected by anything; and our analysis of that which excites feeling, forces us to attribute to its cause a mode of existence not inferior to the effect produced. It is a mere assumption which we cannot even make intelligible to ourselves that the conscious may have flowed from that which is non-conscious—that there can be in the effect what has never been in the cause.

If it be objected that in all this we are accepting the deliverance of subjective thought as a valid ground for affirming objective existence, the obvious answer is that it could not lie with Lord Amberley to make such an objection. If consciousness be the ultimate of existence to us, and the Unknow-

able be akin to consciousness, we are driven to the conclusion that the Unknowable—whatever else it includes—does include thought and feeling as the essence of consciousness. Lord Amberley, we have seen, is compelled to accept the reality of the existence of an objective something which corresponds in some way to the subjective feeling that reveals it. He treats as self-contradictory and as the parent of universal scepticism, which would sweep away thought and being alike, the assertions of those who deny the validity of what are felt to be the necessary deliverances of thought. Thought, then, is ultimate to him, the one unassailable foundation of certainty and knowledge; and having accepted that, he cannot refuse to be bound by the consequences: one of which is that the unknowable cosmic Cause is to be represented as including within itself, though we know not how, active self-conscious Personality.

That he does so, even when he seems most to avoid it, can be proved from the ideals he cherished regarding the future. Lord Amberley's faith in time was great. He believed in the brighter future to which he is always pointing us onwards. He believed in the progressive education of the human race, and its final advance to an ethical condition when men would participate in a nobler state of existence than any before experienced. This advance, this progress, was not and could not be the result of man's fitful and unaided efforts only; for man was in all things, and mostly here, the agent of a higher power. It must be regulated and controlled, then, by that higher power which is working towards the highest conceivable ends. What does this process, this progress from a lower to a higher, from the barrenness and poverty of even such beginnings as we are able to trace back to, imply? We may be unwilling to use the term purpose, in particular, ethical or moral purpose; but where there is process that involves such progress as justifies the faith that good, if not the highest good, is to be the final goal of ill, is there not an attribution of intelligence, of thought; and of intelligence and thought that are distinctly moral to the ultimate being? Good for its own sake is presumably the end to which all things have been working from the beginning; and whatever seeming defeats may have been, are partial and temporary—the process is not interrupted, the evolution goes on to its fulfilment. What higher conception can we have of a moral world-order than this; and, where it is cherished, is there not a faith in something higher than a mere force outside of ourselves? It is a power outside of us which makes for righteousness, and involves the best results of intelligence and moral freedom.

But there is more than this in Lord Amberley's Absolute Force, which is everywhere working in and through all for the

general good of all. With Mr. Herbert Spencer—probably from him—Lord Amberley accepts the Unknowable as the Ultimate; and repeatedly speaks of it as an Unknowable Power, Force, or Cause. He has not by the use of these expressions escaped the necessity of interpreting the phenomena of the universe in the terms of thought and feeling; for the Force, Power, or Cause, which is steadily at work through the ages, bringing order out of chaos, good out of evil, the higher and better out of the lower and worse, is as much an "incarnation" adapted to human ways and weaknesses as the idea of a personal God. We cannot evade the necessity, try how we may, of adopting the thought of man as the final measure of the universe; since all things are intelligible to us in the last resort only as expressed in terms of thought and feeling. When we ask *what* the Unknowable involves, we find that what it has lost in definiteness, it has not really gained in comprehensiveness; and we are driven, if we would include under it the elements given as actual factors in our conception of it, to attribute to it powers and qualities that are only conceivable under their human manifestations.

The education of the human race, we have seen, is tacitly assumed by Lord Amberley as one of these factors. The Power in which we live, and move and have our being, acts on men in such a manner that they are guided towards higher levels of thought and experience. There is actual contact between the objective element and the subjective entity, with the result of elevating even the individual, regarded individually. But it is impossible for us, in trying to fix our estimate of what the Power is which is thus over and through all, to leave out of account the instruction regarding its acts and effects offered us by the processes of history. History implies the idea of Providence, as nature suggests that of Fate. The Power revealed by nature as Fate, is exalted into Providence when we take history as our guide; and the forces which were blind before, now become impregnated with moral purpose. Comparative religion cannot neglect this latter side of experience, in order to give exclusive attention to the other; especially if, as Lord Amberley does, we accept the idea of the unity of origin of nature and man. There is an arbitrary and capricious selection of the kind of experience which alone we allow to determine our views in regard to the Unknowable, when we exclude the experiences of individuals and of nations, in so far as they are evidently due to influences higher than lie within the range of the action of the senses and the understanding. Comparative religion cannot proceed in this manner. It is bound to accept, as the materials with which to work, the whole rich and varied freight of phenomena in the spheres both of nature and

of history, and to learn from them what they have to teach regarding the Power which is so much more than a Nature-force, since the highest testimony regarding its character is derived from the region of moral purpose and spiritual sensibility.

Thankful to Lord Amberley for what he has done (though with faltering step he has only trodden the path in which others before him have made steadier progress), the chief value of his work for us of the present time seems to me to be that he takes us to a point where we cannot possibly rest.

J. SCOT HENDERSON.

VII.—THE VERACITY OF CONSCIOUSNESS.

A point more vital than any in philosophy is the veracity of the mind's revealing. But there are two ways of regarding this veracity. The one is, with such inquirers as Reid and his immediate followers, seeing that the primary deliverances are irresistible and necessarily acted upon by all men, to deem it "metaphysical lunacy," even in philosophy, to question their truthfulness; the other, with Descartes and his school, while admitting that in practice all men must have similar fundamental beliefs, to hold that these beliefs are not, in philosophy, to be accepted as final, save in so far as they repel all doubt. Those having the former tendency, the Natural Realists, contend that the primary declarations possess both a subjective and an objective veracity; while those who have the latter tendency, the Idealists, with a bent of mind amounting to semi-scepticism, maintain that such declarations simply possess subjective veracity.

In this paper, an endeavour is made to uphold Natural Realism, or the Common Sense doctrine, which, let it be understood, is, as here treated, not to be confounded with crude common sense. The former, as herein discussed, adheres as rigidly to the full critical method as does the doctrine of Descartes, of Berkeley, of Kant or of Fichte. There seems to be but one true method for philosophy to observe, and that is, first, to take note of our practical beliefs, then, to resolve these into their primary elements, to test the truthfulness of these by comparing them with each other, and finally by applying to them the ultimate law of contradiction.

But when we arrive at the primary elements of knowing as thus discriminated we are confronted by the fact, plain to Reid, for example, as stars shining in the night, that it is impossible either to prove or to disprove the integrity of consciousness as

an ultimate source of evidence. For it must be very clear that, unless there is already a truthful revealing power, the attempted proof or disproof must be quite worthless, the proof must beg the veracity it would prove, and the disproof the veracity it would disprove. In the last resort, then, we must, in a certain sense, as Hamilton states, "perforce philosophically admit that belief is the primary condition of reason, and not reason the ultimate ground of belief. We are compelled to surrender the proud *Intellige ut credas* of Abelard, to content ourselves with the *Crede ut intelligas* of Anselm."

True, demonstration must ultimately repose on primary data; but when reason is opposed to belief as above, are we to understand by it demonstration simply? Not exactly, but rather that judicial act of mind which weighs all kinds of evidence whether intuitional or inferential.

Philosophy is entirely the result of the more dependent, the more comprehensive, the superior, the judicial intellect insisting that the evidence in full shall satisfy its final craving for certainty. This judicial function of the mind exercises the final decision, sits in ultimate judgment upon the evidence, and either accepts it as satisfactory, or rejects it as doubtful. Authority, according to the law of Evolution, does not increase the nearer we approach the foundations of knowing. On the contrary, it is on the authority of our judicial thinking we finally conclude as to the value of all evidence. It must be very manifest that if we were restricted to our spontaneous or unspeculative thinking, the idea, either with the sceptic of questioning, or with the natural realist of vindicating, its integrity, could no more have occurred to the human mind than the thought of immortality can be presented to the intelligence of the elephant or the dog. In philosophy, therefore, all that passes for truth must be verified by that ultimate criticism, on the existence of which philosophy depends.

If, as Fernier contends, philosophy must be reasoned out from the beginning, this beginning though it cannot be reasoned out, yet may be reasoned *upon* with the view of satisfying ultimate criticism as to the degree of veracity of which it is possessed. How is this effected? In the history of modern philosophy two attempts to solve this question occur to our recollection as of leading importance: the one is that of Descartes; the other that of Hamilton.

Descartes, it is well known, made doubt the starting point of his speculative inquiry; and what fully stood this trial, he discovered, was the fact that he existed as a thinking, doubting, agent. *Cogito*—that fact I cannot doubt, therefore, so far I exist. My consciousness of my existence as a conscious agent

is to me beyond the reach of doubt. Wherefore, consciousness Descartes pronounced to be the basis of certitude. But consciousness, it is too well known, is also the source of much error and deception. How are we to distinguish true from false declarations of consciousness? Descartes saw that doubt is the criterion. It is a mistake to hold that consciousness in general is the basis of certitude. All that Descartes can be understood to claim, consistently with his doubt-test, is that that message of consciousness which does not admit of being questioned is the foundation of truth, that perception which is so clear and obvious as to subdue all scepticism.

But again simply to state that doubt is the test of the veracity of consciousness is about as indefinite as to say that consciousness is the basis of certitude. We need to know what kind of doubt serves this purpose. The doubt-test as applied by Descartes does not keep him from falling into error, and from framing fanciful hypotheses. Leibniz developed this doubt-test into fuller proportions, but, in practice, it still fails to exclude error. The law of contradiction still awaits its fully explicit utterance.

There is indeed a large amount of truth in what J. S. Mill holds in regard to the inconceivableness of the contradictory as the test of necessary truth. Many beliefs firmly stood their ground for a time when thus tested which have since been clearly proved erroneous. The doubt-test could not have been effectual when it thus failed to shake baseless beliefs; it merely served to measure the force and obstinacy with which such beliefs cling to the mind. A proposition may, from the absence of counter evidence to the person who entertains it, appear true beyond contradiction, which, at a later period, turns out to be false. We need, therefore, a more stringent test of truth in philosophy than that afforded by the law of contradiction, the doubt-test, as hitherto understood. This deficiency we shall later on endeavour to supply.

The other instance of a test applied to the truthfulness of our primary beliefs is that to which Hamilton has recourse.

The beginning from which it is contended philosophy must be reasoned out cannot derive additional validity from any prior source,—more especially when it has successfully passed the final examination. But the beginnings of knowing are many and, being co-equal in authority, they admit of being compared with each other in order to discover whether they contradict and by contradicting invalidate each other's authority. Were they to do so, their mendacity, so Hamilton declares, would be proved. This, however, as Mr. Herbert Spencer points out, is a strange assertion for Hamilton to make; for, as shown above, any attempt either to prove or to disprove the veracity of our

primary beliefs must take that veracity for granted. To state, therefore, as Hamilton does, that were our primary beliefs in conflict with each other their mendacity would be *proved*, completely begs the question. At the same time, such conflict, if existing, would have the effect of making absolute scepticism the goal of philosophical inquiry. As might be anticipated, however, the results obtained by the mutual comparing of our primary convictions is most favourable to the truth of Natural Realism, for it is found that such convictions, far from being in a state of conflict with each other, form a most happy family. Of this fact we shall presently have to greet the happy significance.

But let it not be thought that this is the only test which Hamilton recognises of the honesty of our primary beliefs. As a natural realist he contends for the objective validity of such beliefs; and it is in vindication of them in this respect alone that he applies the forementioned test. In relation to the subjective validity of our fundamental beliefs, he adopts the Cartesian doubt-test.

It is highly necessary to have a clear notion of the distinction which subsists between the subjective and the objective report of consciousness. Let us call knowing a revelation. It first of all reveals its own existence as possessed of certain qualities, that is, the knowing reveals itself to itself, and is, in this sense, an object to itself. But here knowing and the object are identical, and this is the only case in which we are justified in declaring that knowing and its object are one and the same. Here the declaration is clear and forcible to the effect that the knowing knows nothing but itself.* In the instance of an external object, however, the declaration is equally clear and forcible to the effect that the knowing does not simply disclose its own existence, but also the existence of something which does not dwell in the mind at all. So far as knowing merely reveals its own existence, we have the facts of the process; so far as these facts reveal the existence of something external to themselves, we have to deal with the objective veracity of consciousness. If these facts be compared to an African traveller narrating his adventures, there cannot be a doubt that the traveller exists, and that he declares his exploits to be of such and such a nature.

* It needs to be explained that knowing does not, at the outset, reflectively know itself, *i.e.*, know itself in such a manner that the psychologist experiences no difficulty in describing its several processes; on the contrary, at first, it only knows itself to that extent which is indispensable to its existence as knowing. Those who like Comte deny the possibility of such a science as psychology are blind to the fact that knowing *quoad nos* underlies everything, and that our objective world is knowing to a greater extent at least than it is not-knowing.

But is his narrative true? As to the facts of consciousness, certain of them report—those that relate to the primary qualities—that objects non-identical with these facts exist. There can be no more doubt of the existence of this declaration than there can be of the existence of the traveller and his narrative. But what about the truthfulness of this declaration? The object in this instance not being identical, says consciousness, with consciousness, the declaration is not self-verifying as in the instance in which consciousness and object are one and the same. In the one case, the mind reveals that something exists, and that something is the revealing itself; in the other case, the mind reveals that something exists, and that something is not the revealing itself; so in the latter case the knowing is not self-verifying; and out of this fact emerges the great problem of philosophy, to wit, *Are primary declarations of consciousness when not self-verifying truthful beyond the possibility of doubt?* This, which has been called the cardinal question of philosophy, is the secret to be won; care, however, being taken that it be better understood than it was by Reid and his more immediate followers: practical must not be confounded with speculative conviction, for the former does not necessitate the latter. To cite a memorable instance of this fact—In outward perception as relating to the primary qualities, the declaration is most clear to the effect that there is an external world existing independently of the percipient, and, in practice, we are forced by our constitution to place implicit reliance in this declaration. This, however, is only practical conviction, and constitutional, irresistible, unchangeable, and universal though it be, it is not, as respects its veracity, considered by all to be beyond the reach of doubt. We lay the more stress on this distinction, because Reid and his immediate followers seem wilfully to shut their eyes to it, and to argue with the “vulgar” that if a man in the character of a philosopher, cannot trust his senses, he should, to be consistent, fall, heedless of their warning, into the fire, or leap over a precipice.

It has already been mentioned that Hamilton's guarantee applies solely to the objective trustworthiness of our original beliefs. The subjective integrity of these, he reckons to be placed far beyond the range of scepticism. “The facts of consciousness as mere phenomena,” he affirms, “are by the unanimous confession of Sceptics and Idealists, ancient and modern, placed high above the reach of question.” Descartes could not doubt that in so far as he was conscious he existed. Hume never brought his scepticism to bear upon the existence of impressions and ideas; and J. S. Mill affirms that there is no appeal from the human faculties generally. Here, then, in the

very centre of our intelligent being is a stronghold of certainty which ever did and ever will continue to prove impregnable. The subjective veracity of consciousness being, therefore, criticism-proof, the problem remaining to be solved relates merely to the objective veracity of consciousness when it affirms the existence of the primary qualities. Hamilton did much to establish this objective veracity, yet after all his efforts, he has to make the admission that to suppose the mendacity of the non-self-verifying is not self-annihilating, as is the supposition that the self-verifying is mendacious. "The Idealist," he remarks, "in denying the existence of an external world as more than a subjective phenomenon of the internal does not advance a doctrine *ab initio* null, as a scepticism would be which denied the phenomena of the internal world itself." After an admission of this kind, it is not surprising that such a luminary as Ferrier should arise in the firmament of Scottish metaphysics, and that he should affirm—"My philosophy is Scottish to the very core, it is national in every fibre and articulation of its frame". Now the peculiarity of the present exposition consists in holding, in opposition to Hamilton, that the idealist, in denying the objective integrity of the primary conviction relative to the independent existence of the non-ego, *does* advance a tenet *ab initio* null.

It is an admitted law in respect to the primary judgments as revealing themselves, the self-verifying, that they cannot have their veracity called in question without involving a direct *subversio principii*. Now an objective primary declaration must have its basis in a subjective declaration. Thus, the declaration that the primary qualities have an *esse* which is not *percipi* does, at all events, exist as a declaration, as a phenomenon, that is to say, a base. But is this base, moreover, a truthful objective deliverance? The idealist says it is not. The *esse* of the primary qualities, as of every other quality, he maintains, is *percipi*. Now this is a statement, observe, in regard to the nature of the self-verifying itself, and is in direct contradiction to what the self-verifying reveals of itself, namely, that the *esse* of the primary qualities is not a constituent part of the self-verifying, is not *percipi*. This negating by idealism of a self-verifying deliverance proves it to be, not merely a "baseless paradox," but a *subversio principii*.

By way of illustrating the doctrine here advanced, let us enter into a criticism of Ferrier's views as conveyed to us in *The Institutes of Metaphysic*. Ferrier strongly insists that the primary data of consciousness, even as explicated, criticised and vindicated by Hamilton, are natural inadvertences; that philosophy assumes and must assume that man does not naturally think aright, but must be taught to do so; that truth does

not come to him spontaneously, but must be brought to him by his own exertions; that philosophy must be reasoned out from the beginning. Yes, from the beginning certainly, if it is to be reasoned out at all, but what is this beginning, and how does it in the ultimate judicial scrutiny certify us of its integrity? Ferrier's datum is this:—"Along with whatever any intelligence knows, it must, as the ground or condition of knowledge, have some cognisance of itself." In further explanation of this principle, Ferrier states "that the object of knowledge, whatever it may be, is always something more than what is naturally or usually regarded as the object. It always is and must be the object *plus* subject, thing or thought *meum*. Self is an integral and essential part of every object of cognition." Yes, of every self-verifying object, of the object that is identical with knowing. But there is an object which is non-identical with the knowing, so says the knowing itself, and if this assertion cannot be doubted without the doubt being self-contradictory, what then?

The most obvious objection to which Ferrier's first principle lies open is that which has been urged with so much feeling by Reid and similar inquirers—it is in contradiction to the very clear and universal belief that objects proper exist. Here, then, are two declarations of consciousness in fierce antagonism to each other, and one of them constitutional, irresistible and unchangeable. But is it not highly improbable that there should be an unavoidable feud between two states of mind? "Nature," as Hume confesses, "is always too strong for principle;" and Fichte admits that "How evident soever may be the demonstration that every object of consciousness is only illusion and dream, I am unable to believe it." Here we have, for the philosopher, then, as a cruel and monstrous necessity, a mind divided against itself. O blissful ignorance of the many, if this be the result of knowing philosophy!

But seeing that our primary beliefs cannot be extinguished even when proved, as held by some, to be natural inadvertences, how comes it to pass that so much reliance is placed by the idealist on what gives them the lie? The reply to this query will most likely be as follows. The subjective authority of consciousness is more to be respected than its objective authority. Ferrier's datum is a subjective disclosure, a fact of consciousness; whereas, the objective deliverance which it negatives is of lower authority, and only to be accepted as a phenomenon. Now, mark well that such antagonism as is here indicated exists neither between any objective deliverance and its base; nor, as Hamilton has shown, by means of the test noticed above, between any primary belief and its fellow. Where, then, seeing

that Ferrier's first principle possesses neither of these peaceable characteristics, are we to seek for its origin?

When data purporting to describe laws of mind are mutually contradictory, it is more reasonable to conclude that some of them must be faulty, than that the mind should be cruelly divided against itself; and, indeed, when the several data are minutely examined it is found that, as "God made the country but man made the town," so the primary data of consciousness are the inherited mental groundwork of all mankind, while other data are acquired by observation and experiment, and frequently by anticipation. The one forms Nature's capital; the other, the acquired possessions which necessarily imply the pre-existence of such capital. Now acquired data are frequently found wanting when weighed in the balance of exact inquiry. This being the case, there is but one sound conclusion at which to arrive, namely, that the acquired data are more likely to be at fault than the fundamental and universal assurances of the mind. This rule is set at nought by Ferrier, who argues that philosophy assumes and must assume that man does not naturally think aright, but must be taught to do so; which is as much as to say that Nature's declaration as to the independent existence of the primary qualities is to be corrected by an acquired datum; for, as has been shown, a self-verifying declaration, or a subjective fact of consciousness, Ferrier's datum is not. Where, then, is its origin to be sought?

In order to answer this question, it is needful briefly to refer to the "ideal hypothesis". Reid slew this hybrid obstruction to the truth, and thus bodily made a clearance of it. Its ghost, however, still remains to haunt and bewilder the mind of metaphysicians; and it is now high time, if Philosophy is to take her fitting place in popular regard, that this ghost should be laid for evermore. The essential feature of the ideal hypothesis, it need not be stated, is holding that the mind cognises external objects through a medium or *tertium quid*. Now the idealist pretends successfully to have proved that such medium is the only object of cognition. With him, the representing object of Descartes and of Locke is made to displace the represented object, and is constituted the only object. An object is necessarily retained, but instead of admitting it to be external, not *in* the mind, as Reid and consciousness declare, it is held to be simply a modification of our subjectivity—Being is merely a phase of Knowing.

This view, for the reasons herein adduced, we feel convinced, is erroneous. No object proper forms a constituent part of the fact of consciousness—of that which is self-verifying—of that which declares that an object proper is not *percepti*—of that

which cannot be thought mendacious without such thought being self-subversive.

In further explanation of this problem it is desirable to state that when we know the qualities of the material self in correlation with those of the not-self, the consciousness is double, forming one whole, the two parts of which are *similar* indeed, but distinguishable. Thus, when in touch we feel the organism as resisted over an extended surface, we also feel that it is resisted by a co-extended resisting externality. This fact seems to have led to the notion that in touch, an impression is made as by a seal upon wax, and that the impression thus made reveals the existence of the external object by corresponding with it. But this is the representative doctrine, which is not proof against scepticism. According to that hypothesis one part of the double process only is immediately known, and serves to suggest to the imagination that which makes the impression. This is not the doctrine of a double consciousness in perception; according to which doctrine both parts of the double consciousness simultaneously exist forming a single act of knowing, a relation between ego and non-ego.

It has to be explained that the double consciousness of which we are treating exists solely in the case of touch and the motor sense, the perception of the primary qualities. In the case of the other senses, consciousness is single. Colour does not involve a co-extended colour, nor sound a corresponding sound. In these instances, the external cause of the sensation is not directly known, it is inferred. The object of touch and the motor sense being perceived at one and the same moment as we experience sensations of colour, sound, scent, an association is formed between the latter and the former, and the inference comes to be made that the exciting causes of the latter issue from the objects revealed by the double consciousness, these objects being the substratum to which the secondary qualities or external excitants of the single consciousness are, by inference, attributed.

The conclusion which has now been arrived at is this :—While the single consciousness (regarded as a primary deliverance) reveals simply its own existence as the self-verifying, the double consciousness (regarded as a primary deliverance) directly and clearly reveals the existence of the non-self-verifying. Then the self-verifying base of the double consciousness declares that the non-ego is not a constituent part of such base, is not *percipi*; and to negative this subjective declaration, as idealism seeks to do, is to commit a *subversio principii*.

There is one other point which it is highly desirable to notice. In the Order of Evolution, the Category of Difference is prior to

the Category of Resemblance. It is the condition of a general notion that it must be founded on the similarity to each other of individual cognitions. Discrimination, or the cognition of objects as mutually differing in individuality or number, is prior to the cognition of the same objects as mutually resembling. Now idealism is founded on a complete violation of this order. Let us select for criticism, as an illustration of this statement, the view expressed by J. S. Mill in the following words:—

"There is not the slightest reason for believing that what we call the sensible qualities of the object are a type of anything inherent in itself, or bear any affinity to its own nature. A cause does not, as such, resemble its effects; an east wind is not like the feeling of cold, nor heat like the steam of boiling water; why then should matter resemble our sensations? why should the inmost nature of fire or water resemble the impressions made by these objects upon our senses? And if not on the *principle of resemblance*, on what other principle can the manner in which objects affect us through our senses afford us any insight into the inherent nature of those objects? It may, therefore, safely be laid down as a truth both obvious in itself, and admitted by all whom it is at present necessary to take into consideration, that, of the outward world, we know and can know absolutely nothing, except the sensations which we experience from it."

We submit that the argument by which Mill here supports his position is fallacious. When an organ of sense is excited into activity, and this excitation is continued by the afferent nerves to the related sense-centres, and so on till the final result is reached—the revealing, by the double consciousness, of the primary qualities as external to the organism, what meaning can there be in the intimation that unless this revealing resembles the object proper, we can have no knowledge of such object? The judgment which determines the existence of resemblance or non-resemblance involves prior knowing, knowing, which, in the Order of Evolution is at the root of all other. The consequence is, that whenever an attempt has been made to explain the primitive act of knowing a *petitio principii* has been committed; for these explanations are all based on the supposition (or the denial) that something in the mind resembles the external object, and thus alone reveals its existence. To assert, therefore, that we can know nothing of non-self-verifying objects because our knowing bears no resemblance to them is on a par with saying that we cannot learn the alphabet because we have not learnt to read. The double consciousness reveals to us that non-self-verifying objects exist, namely, the extended ego in relation with the co-extended non-ego, and the resisting-ego in relation with the counter-resisting non-ego. To ask how

it does this is to seek an explanation of the inexplicable, to seek a beginning beyond the beginning; and to ask whether the double consciousness can in philosophy be relied upon is to raise the question which in this contribution has been answered in the affirmative. Indeed, when we behold in man a series of nervous systems, one evolved out of the other, a complete microcosm; when we turn our thoughts to the different grades of the animal and the vegetable kingdoms, each higher grade implying the pre-existence of a lower in speciality and dignity; when we turn our thoughts to the several geological eras, to the sedimentary strata, still further back to the rocks of eruption, further back still to the nebular period of planetary formation, how can we, with so able an interpreter of the Order of Evolution as Mr. Herbert Spencer, avoid coming to the conclusion that idealism is, as we have attempted to demonstrate, a doctrine *ab initio* null.

W. G. DAVIES.

VIII.—PHILOSOPHY IN THE SCOTTISH UNIVERSITIES. (I.)

SOME people, both south and north of the Tweed, are found in these days not unfrequently to talk and write as if the Universities of Scotland were simply large Public Schools of the English type, and of rather an inferior sort. They look to the school-subjects that are taught—Latin, Greek, and Mathematics—and disregard, or have a very vague idea of, any other kind of instruction given in them. The discussions about the Scottish Universities are thus very apt to take a one-sided course, and to be restricted to questions regarding the degree of classical preparation with which students enter or ought to enter them. All through those discussions there is little perception or recognition of the fact that these Universities have been from their foundation and throughout their history seminaries of Mental Philosophy,—of Logic, Psychology, Metaphysics, and Ethics. This holds especially true of the three oldest of them—St. Andrews, Glasgow, and Aberdeen. In these, the first constituted Faculty was that of Arts; it was the fundamental Faculty in them and in all the mediæval Universities, and it was made up of the three departments of Logic, Physics, and Ethics. Even the Physics of that day included reference to the phenomena of Mind; and in some of the Universities we find, until very lately, Pneumatology as a part of what is now known as Natural Philosophy. Greek, Latin, and Mathematics,

came gradually to be added to the Faculty of Arts. Greek was first known in Scotland, and first taught in the Universities of Glasgow, Aberdeen, and St. Andrews, about the middle of the 16th century. The learned, zealous, and vigorous Andrew Melville introduced the teaching of Greek into the University of Glasgow in 1574, and into that of St. Andrews a few years later. There is, however, some probability that Greek was known and taught in Aberdeen a quarter of a century even before this date, for Greek orations were made in that University before James V. and his Queen in 1541. The teaching of Latin as a language was not a part of the University curriculum until after the decline of learning in Scotland which followed the Reformation. From the foundation of the older Universities, a knowledge of Latin was imperative on the Intransigent or Bajan student (*Bec jaune*, Yellow Neb),—such an amount of knowledge, at least, as enabled him to follow the expositions of the Regents. We find in Glasgow statutory prohibitions even of the use of the vernacular among the students, and the requirement of Latin in their ordinary intercourse.* A student was further interdicted from having a servant in the college, or bringing in a friend, “*nisi scholasticum sermonem callentem*”. The institution of the Latin Chairs in the Universities—in Edinburgh, 1583, St. Andrews, 1620, Glasgow, 1637—may be said to correspond with a continuous decline in the school-teaching of the language.† The Chair of *Literæ Humaniores* was chiefly valuable as showing a recognition of the new spirit and studies of the Reformation period. There were disputes shortly after the foundation of these Chairs between the Colleges and the teachers of the remaining higher class Grammar Schools, as to the limits of their respective provinces.

Philosophy, especially Dialectic, was thus the characteristic study of the Scottish student from the foundation of the Universities. In the olden times, as now, it was his strong and cultivated faculty. During the latter part of the fifteenth, through the whole of the sixteenth, and the greater part of the seventeenth centuries, the errant ‘Scot abroad’ was known as much in the disputations of the continental Universities for his skill in dialectic, learned at his native Schools, as he was famous for his readiness and courage in following a military leader—native or foreign—a Douglas or a Gustavus Adolphus—to the battle-fields of France, and the wars of ‘Hie Germanie’.

* *Munimenta Almæ Universitatis Glasguensis*, II., 41, temp. Jac. V.

† The Humanity Chair in Aberdeen was not instituted until 1839. Was this because the teaching of the Grammar School was so good that a Chair was not required in the University?

As Erasmus said of the mediæval Scots, "dialecticis argutiis sibi blandiuntur". Among those 'knight-errants' of the schools, we have several distinguished names. A short list of the most prominent of them is not without interest. In the 15th century, Scotland sent from its native Universities to those especially of France, as Regent teachers of Philosophy, Thomas Otterburne, Henry Leighton, Robert Fleming, Thomas Mushet, Umfrid Hume, James Martin. In the 16th century, we have the well-known Hector Boece, the 'first doctor' or teaching Regent of Aberdeen, recalled from the Sorbonne by Bishop Elphinstone, to help the young University. John Major, George Lockhart, and William Gregory, of the College of Montacute, are all distinguished names, and taught with great success in the University of Paris. Gregory afterwards went, as Professor of Philosophy, to Toulouse, where he died in 1527. Archdeacon Bellenden and Richard Moryson, who taught abroad, were Aristotelians reputed second to none in their time. Early in the 17th century, we have George Eglishemmus (Eglesham), John Walker (Vigilantius), and, greatest of all, the three names of Robert Balfour, Mark Duncan, and William Chalmers. Eglesham, Walker, and Balfour, were all of St. Andrews. Eglesham was Professor of Philosophy at Leyden, and is the author of *Animadversiones in Aristotelis Logicam*. Walker was Professor of Philosophy at Nîmes, and is the author of *Prefationes in Aristotelem*. Robert Balfour, of Fife extraction, was long Rector (Principal) of Bordeaux, and wrote *Commentaria in Universam Logicam, in Physicam et Ethicam Aristotelis*,—commentaries which, for ability and learning, are in the first rank. Mark Duncan was Professor at Saumur. His *Institutio Logica* appeared there in 1612. It was a work of the very highest repute, and is even now of great value. William Chalmers of Anjou is the author of *Disputationes Philosophicæ, and Introductio ad Logicam*. Gilbert Jack of Marischal College, Aberdeen, was Professor of Philosophy in Leyden. Even the famous Burgersdick, who succeeded him, did nothing more than sustain the reputation of his predecessor. Jack was distinguished alike in Medicine and Philosophy. Bayle speaks of him as one of the subtlest Peripatetics of the age. He was the author of *Primæ Philosophiæ Institutiones*, Leyden, 1616. Walter Donaldson, also of Aberdeen, was Principal of Sedan, and gave to the world, in 1612, at Frankfort, his *Synopsis Locorum Communium*. Then there is the name of David Buchanan, Regent in Paris, author of the *Historia Animæ Humanæ*, 1636, and *L'Histoire de la Conscience*, 1638. The tendency to philosophical study which had been encouraged by the native Universities and grew to maturity abroad, re-acted on these Universities in turn;

and in the middle of the 17th century, we have the distinguished name of Robert Baron of Aberdeen, one of the 'Doctors' who stood by Laud and the Service-book,—a metaphysician of wide continental reputation. By the side of Baron, and even superior to him in originality, we must place George Dalgarno, also of Aberdeen, the now well-known author of the *Ars Signorum, vulgo Character Universalis et Lingua Philosophica*, London, 1661. Afterwards, Bishop Wilkins took up the humble Aberdonian's idea, and made for himself a name in his time.

In this connection I need not at present do more than refer to the number and succession of original works contributed to the literature of Philosophy by the occupants of philosophical chairs in the Scottish Universities, since the old system of Regenting was superseded by that of the Professoriate in the first quarter of the last century. There is not a single University which cannot point to a name of some distinction in this walk of literature, and the philosophical writings thus originating have so many features of method and matter in common—such a general consensus in the development of doctrine—that they have appropriately been regarded as forming a distinctive school of philosophical opinion. Those interested in the 'Endowment of Research' might fairly be called upon to study the philosophical literature of the last hundred and fifty years which has emanated from the Scottish Universities. The views of some of them regarding the province within which research may profitably be conducted, might probably receive some enlargement. It might also be suggested that teaching and research are by no means incompatible, rather mutually helpful.

In the Universities of Scotland at the present day, after all the changes of constitution which they have undergone during four hundred years, the subject of Mental Philosophy occupies, if not an exclusive, at least a very prominent place in the curriculum of Arts. For the degree of Master of Arts, this department constitutes, as I shall afterwards show, a proportion of requirements such as is not found in Oxford, Cambridge, or Trinity College, Dublin. The teaching of Mental Philosophy is addressed to a class of students of an age considerably higher as a rule than that of those who undergo the classical training. The Scottish Universities must, therefore, be judged as well by the relative merits of Mental Philosophy as a study and a discipline, and by the way in which it is taught, as by any comparison of them with Universities which aim exclusively, or even mainly, at reaching a high standard in classics and mathematics. Any criticism of the Scottish University system, or proposed reform of it, which ignores or under-estimates the historical

and the actual place of Mental Philosophy as an essential part of its discipline, is neither intelligent nor just.

In seeking to deal briefly with the course of Philosophy in the Universities of Scotland, and the arrangements that have been and now are in use for the teaching of it, reference must be made to the changes of constitution which those Universities have undergone, to the bearing of these changes on philosophical instruction and to the progress of philosophical thought in the Universities during the last four hundred years. It may possibly be found that a review of those points has some little instruction for us, now that a Royal Commission is dealing with institutions, which have their roots deep in the past, and which have grown up and been modified so as in the main to suit the national requirements.

The Scottish Universities were originally connected with the Universities of the Continent, and their system of study. Although the neighbouring English Universities were in existence, they had no influence on the framework of those in Scotland; and while there is frequent reference to the constitution and usages of Bologna, Paris, and Louvain in the records of the Scottish Universities, there is none to Oxford or Cambridge. The bright promise for Scotland which arose with David I. in 1124, had been darkened by the death of Alexander III. in 1286. In the comparatively peaceful time before the death of Alexander, John Baliol and his wife Devorgilla, the parents of King John, had founded a college in Oxford, between 1263-68, with some view to students from Scotland. And we find at least two names of Scotsmen of historic and legendary mark who studied at Oxford about this period. The one is Michael Scott, the reputed 'Magus,' but really an able mathematician and learned commentator on Aristotle. The other is his contemporary, Joannes de Sacrobosco (Halywoode), whose treatise *De Sphaera Mundi* was afterwards for long a text-book in the Scottish Universities. Both of these, however, completed their studies in Paris. The War of Independence which followed left no leisure for the pursuits of learning. In it were destroyed or crippled nearly all the abbeys and religious houses of the country—especially of the Lowlands—which alone, by means of the schools attached to them, had kept up any degree of learning and culture in the country. The struggle between the Anglo-Scot of the Lowlands and the Anglo-Norman of England—the spirit of individualism striving with that of feudal domination which continued for many centuries onwards—rendered it almost impossible for the Scottish student, if indeed he existed in those days, to repair to the neighbouring Universities of England. Usually the northern aspirant after learning who

dared to brave the perils of a journey to Oxford, and the treatment he met with there after he reached it, needed a special safe-conduct from the English king. It was under such a safe-conduct that John Barbour, the afterwards famous Archdeacon, went to Oxford along with three students from Scotland. The journeys thither were thus, doubtless, few and far between. Usually it was a continental University, and especially that of Paris, to which the future Scottish ecclesiastic or lawyer had recourse. France during the Middle Ages was the natural ally of Scotland. As early as the time of Robert Bruce, when his nephew Randolph Murray was in Paris negotiating a renewal of the Scoto-French alliance, the patriotic Bishop of Moray, appreciating the wants of the youth of his country, founded in the University of Paris a College known as the Scots' College. This and another College in the same University, that of Montacute, were the favourite resort of the Scottish student down to 1411, the date of the foundation of the oldest Scottish University,—that of St. Andrews. For Scotsmen to repair to the University of Paris, both as students and Regents, was common even for generations afterwards. The Scottish student was as familiar in the fifteenth and sixteenth centuries with the streets and alleys of Paris, as he now is with those of Edinburgh or Glasgow. The names and labours in Philosophy in the University of Paris, in the early part of the sixteenth century, of John Major, “discceptor acutissimus,” George Lockhart, and William Gregory, throw a lustre over the expiring day of Scholasticism.

The wave of continental learning at length reached the shores of remote Scotland, and one century—the fifteenth—witnessed the foundation of the three oldest Scottish Universities—St. Andrews first, as we have said, in 1411, Glasgow in 1450-1, and University and King's College, Aberdeen, in 1494. Marischal College and University, Aberdeen, was founded by George Keith, Earl Marischal, about a century later, in 1593. The two Colleges and Universities of Aberdeen were fused into one in 1860. Edinburgh, the creation of James VI., rose after the Reformation in 1582. It cannot be said at any period of its history to represent the model of the old European University. It never participated in the mediæval organisation; it rose and it has won its fame and displayed its usefulness as, what without disparagement may be named, a ‘teaching institution’ in the more modern period of the Scottish Universities. These, with the exception of Edinburgh, are a legacy to the nation of the churchmen of the fifteenth century. That they contributed to the overthrow of that Church which produced them, there can be little doubt. Until that fifteenth century, the education and upbringing of the future Scottish

ecclesiastic and lawyer was foreign; he became associated in feeling and culture with the great ecclesiastical and academical unity of Europe; and it is probable that, but for the institution of the native Universities and the substitution of home influence and associations for foreign training, the Scottish Reformation—an ecclesiastical revolution—would not have been carried through with so little upheaval of society as it was.

Those of the Universities of Scotland which were founded before the Reformation, *viz.*, St. Andrews, Glasgow, and Aberdeen, thus carry us back to the continental Universities of the twelfth and thirteenth centuries. In their earlier constitution, they recall a foreign model, and in their subjects and manner of teaching, they resemble the typical European University of the Middle Ages. They were avowedly instituted as a part of that great system of continental education, the head of which was the Pope, and whose charter and license was a Papal Bull. They were incorporated members of the great educational confederation of the Catholic world; and their graduates had consequently the privileges of continental graduates; they were *free*, as it was termed, of all the Universities of Europe. It was this which made it easy for the Scottish students and Regents to flock over Europe, and to pass restlessly from University to University. "*Sedem saepius commutavit*" was said of George Buchanan. It might have been said with equal truth of most Scottish Regents and Professors abroad. The degree or license to teach, the ready command of Latin, and the quick wit in dialectical disputation, were all the poor Scottish scholar cared or needed to carry with him from home. They were his passport through the Universities of Europe, and they enabled him to work his way to the highest offices of teaching in those seats of learning.

The two great Universities of Bologna and Paris—the former going back to a very remote time, the latter dating from the twelfth century—were the general models of the Scottish Universities. Directly, however, the exact constitution and most of the arrangements in them were borrowed from Louvain. And we know how Paris and Louvain arose. The oldest educational influence in Western Europe was a portion of the logical treatises of Aristotle, translated by Boethius in the sixth century. The Cloister-Schools of Charlemagne in the ninth century rendered them directly available for purposes of education, and those treatises, along with some sprinkling of Neo-Platonism, afforded nearly all the intellectual nutriment of Western Europe down to the twelfth century. In this century, through the crusades, and especially intercourse with the Universities of Spain, the parts of the *Organon* not before known to Western Europe and the other works of Aristotle—psycho-

logical, physical, and metaphysical—came within reach of the cloister scholar in the form of Latin translations from the Arabic.

"Solus Aristotelis nodosa volumina novit
Corduba."

The scholars of Constantinople also contributed certain translations from the Greek originals. Out of this addition to the scant treasures of learning arose, about 1142, shortly after the time of Abelard's teaching, the beginnings of the second epoch of Scholasticism. This is generally described as the fullest development of the application of the dialectic method to theology; but in truth it was, through this application and the views opened up in connection with it, a laborious working out of thought to questions about reality of the deepest human interest. To the possession at first of those portions of the *Organon* known before and up to the time of Abelard, and to the additions made in the twelfth century, we owe, in a great measure, the foundation of most of the continental Universities, —especially Paris and Louvain; and with the gradual discovery and spread of the Aristotelic MSS. in Europe, grew up the subjects of teaching in the Faculty of Arts—the fundamental Faculty of the mediæval Universities, for to pass through it was regarded as indispensable to the study of law and theology.

Further in this twelfth century, the awakening intellect of Europe was deeply interested by the discovery of the long lost *Pandects* of Justinian. The same century was enriched by the publication of the *Decretals* of Gratian, and the *Sentences* of Peter Lombard. The study of those treatises soon came to be eagerly pursued in an age deeply occupied with civil and ecclesiastical organisation and theological dogma. They gradually came to be the subjects or text-books of instruction. In the absence of printing, the books could not be spread over Europe; learners must come together from different nations to hear them read and expounded; hence teachers at common centres became incorporated, and there thus arose over Europe the mediæval Universities, and in these the four Faculties of Arts, Civil Law, Canon Law, and Theology. The Faculty of Arts had for its aim instruction in the Aristotelic treatises; Civil Law had for its subject the *Pandects* of Justinian; Canon Law dealt with the *Decretals* of Gratian; Theology taught, as its Bible, the *Sentences* of Peter Lombard. The *pabulum* of the mediæval University was thus books, and its teachers were in the main 'Readers,' whose obligation and duty it was—originally fixed by oath—faithfully to expound the books, the *quodlibeta*, prescribed by the annual committee of the University presided over by the *Quodlibetarius*.

This necessary historical sketch suggests two points for our

notice. The one is the method of instruction in the Scottish Universities during these early centuries, and the other is the material of instruction.

In theory, as is now generally acknowledged, every Master of Arts was privileged to teach in the University. There was even a period of two years after graduation of necessary regenting. This was ultimately compounded for by the payment of a fine. In the Italian Universities, before 1400, and in some of the more western Universities, the practice of graduate teaching had ceased, if, indeed, it ever was in general force. In Glasgow and Aberdeen we find the salaried Regent in existence from the foundation of each University. There seems to be no evidence of free graduate teaching in the Scottish Universities. Salaried Regents, or Regents having Church benefices, were the earliest academical instructors. These were followed by unbeneficed Regents, who depended on the voluntary offerings of the students. It was indeed owing to a provision of endowment for the Regents in Arts that the Faculty came alone to be fully constituted in the Scottish Universities. Neither Civil Law nor Canon Law appears ever to have reached the maturity of a Faculty. In the pre-Reformation Universities—St. Andrews, Glasgow, and Aberdeen—and in Edinburgh during the seventeenth century, the practice of teaching by Regents prevailed. The system implied that the same teacher carried on his students from the first year of their course to its close—a period of three years and a half—when they were presented for the degree of Master of Arts, having previously taken those of Bachelor and Licentiate in Arts. One Regent, therefore, instructed the same class of students in all the departments of academical study.

Regenting was essentially a method of teaching by means of approved books. The Regent read, expounded, and dictated to the student, who was called upon to write carefully and at full length the *dictata* of the Master. On these he was examined and exercised, chiefly by means of the practice of disputation. This, in its most public form, was known as 'determining'. It took place in presence of the whole University. The meeting was presided over by one of the Masters, who proposed the questions, in Ethics or Metaphysics. The youthful students of Logic (*juvenes Logicæ studiosi*) showed their proficiency in the art by there and then giving their opinions on the question.

The system had the advantage of a close personal supervision of the student by the master, who was thus able to study and influence the character of those under him, as well as watch their intellectual progress. And so far as classical learning was concerned, there can be no doubt that it issued in accurate

scholarship. Through the regenting system in the Universities and the high standard of teaching in the Grammar Schools of the country, Scotland, especially during the sixteenth century, produced men whose Latin scholarship was as high as any in Europe, and not to be paralleled at the time by any in England. The names of George Buchanan, Florence Wilson, Henry Scrimger, Arthur Johnston, and several others testify to this.

In Philosophy, however, the system of regenting cannot be said to have acted so well. The teaching of Philosophy by means of approved books is better than none; but it is not a good arrangement. Its tendency is to make little demand either on the research or the power of active thought of the teacher, and thus to repress originality. However much it may conduce to accuracy in the mastery of the books, it is not likely to promote the habit of original speculation either in master or pupil, or to lead to progress in philosophical science. The system, accordingly, though greatly fostering dialectic skill in the mediæval student, proved generally barren in respect of original works in Philosophy. It certainly produced very able and learned treatises particularly in Logic, and in dogmatic and polemical Theology. The names of Major, Lockhart, Mark Duncan, and Robert Balfour, alone testify to this, though it should be remembered, that these men were not products exclusively of the Scottish Universities, having passed into the wider circle of European thought, and being frequently teachers of Philosophy exclusively—in fact, Philosophical Professors.

In Scotland, the regenting system continued with some slight breaks and attempts at reform, until the first quarter of the last century, and even later. In St. Andrews, the system was exchanged for that of the Professoriate at the union of the Colleges there in 1747. In Aberdeen, it lasted down to 1754. In Glasgow, a Professoriate was instituted in 1577. The Regent Morton carried out the ideas of Melville; but regenting was resumed in 1642. The professorial system was finally constituted there in 1727. The Edinburgh regenting gave place to the professoriate in 1708.

The first point in the professorial system, as compared with that of the Regents, is the restriction of the teaching of the Professor to a definite subject—one out of the many which each Regent was called upon to teach. This leads to a concentration of energy on the part of the Professor, to a fuller and more consecutive study of his subject, and it avoids the distraction arising from the necessity of mastering, in probably a general way, several subjects of instruction.

The second point is, that there is no restriction in the teaching to specific books. The Professor is left free to arrange and

develop his subject as he chooses, and to contribute, if he can, to its progress in his lectures. He is thus able to give a comprehensive and systematic view of the various points of his subject, as opposed to that afforded by an ill-assorted congeries of books. The greater concentration upon the department of which he treats, the freer spirit of research and independent thought thus engendered, have certainly left their mark on Philosophy in the Scottish Universities. Since the institution of the Professoriate, upwards of one hundred and fifty years ago, there has arisen (as said above) in Scotland, and most of all in the Universities, a course of independent philosophical thought—continuous, yet with a common character and tendency—so marked as to entitle it to the name of a school, and to make it influential in other countries, as, for example, in France and the United States of America. In this particular, the contrast between the comparative barrenness of the three hundred years of the system of Regenting and the productiveness of the Professoriate does not admit of dispute; and it might be added that, so far as the discipline of the student in Philosophy is concerned, there can be nothing more influential than a lucid lecture and the following, from day to day, of a clear, orderly, and consecutive train of thinking.

It is not my purpose to make any invidious comparison between the English and Scottish Universities; but I may point in this connection to the retention, almost exclusively, of the tutorial or regenting system alike in Oxford and Cambridge. As has been said, "down to the present day the College tutor at Oxford and Cambridge is theoretically instructor in all subjects, however heterogeneous and dissimilar".* If, instead of *theoretically*, we read *actually*, for the tutor is not *de jure* the instructor—the common or public instructor of the University—this statement is indisputable. We may add that the English system retains also the material of book-teaching for the Degree, which was a main feature of the old regenting arrangement. It would not be straining an inference if we were to connect as an effect with these two causes, the admitted absence of original thought in the form of contributions to the progress and the literature of Philosophy in the history of those Universities.† The system of the Tutor or Regent is one that must always be dependent for its *pabulum*—its thoughts, in a word—on sources extraneous to itself; and it is likely to be wholly satisfied with

* *Westminster Review*, No. xcvi., p. 342.

† Of late, in both Universities, there have been signs of awakening original power in Philosophy. It has no root, however, in any foregoing thought in either University; its inspiration is entirely foreign, and it is the outcome of individual force, not of the system.

this supply. What will 'pass' men for the Degree, or get them Honours, is the goal of its ambition. It looks simply to what 'pays' in the form of University *imprimatur*.

But a very important question arises, affecting the history alike of Philosophy and Theology in Scotland, *viz.*, What were the materials of this system of Regenting? What were the books and treatises, the ideas of which were constantly, persistently, and even authoritatively impressed on the youth of the country for nearly three hundred years?

The ancient record of the Faculty of Arts in Glasgow gives us an interesting glimpse into the subjects of instruction in Philosophy at an early period after the constitution of the University, in the reign of James II. In 'the old art of Logic,' the ordinary treatises were "*Liber Universalium Porphyrii, liber Praedicamentorum Aristotelis, duo libri peri Hermeneias*" [*Περὶ Ἑρμηνείας*, in a Latin translation]; in 'the new Logic,' "*Duo libri Priorum [Analyticorum], duo Posteriorum [Analyticorum], quatuor ad Minus Topicorum, scilicet primus, secundus, sextus et octavus, duo Elenchorum*". In 'Philosophy,' they were "*Octo libri Physicorum, tres de Coelo et Mundo, duo de Generatione et Corruptione, tres libri de Anima, De Sensu et Sensato, De Memoria et Reminiscentia, De Somno et Vigilia, septem libri Metaphysicae*".* Among the extraordinary books, with regard to some of which the Faculty might exercise discretion in the examination, there are:—The text of Peter Hispanus "*cum Syncategorematicis, tractatus de Distribucionibus, liber G[ilberti] P[ol]l[etani] Sex Principiorum*"; in Philosophy, "*Tres libri Metheorologicorum, tractatus de Sphaera sine dispensacione, sex libri Ethicorum, si legantur perspectiva, algorismus et principia geometriae*," &c.†

A scrutiny of the list indicates exactly the progress of Philosophy in Europe at the time. The *Vetus Logica* here referred to comprised the *Isagoge* of Porphyry and those portions of the *Organon* of Aristotle which were known and studied in Western Europe up to the middle of the twelfth century (about 1142). They were all that were known even to Abelard, at least in his days of lecturing; and they were known to him only in the Latin translations of Boethius. They referred mainly to Terms and to the Predicables,—to Definition, Division, and Classification, and certain grammatical analyses. The *Nova Logica* was an advance on the old, and eagerly hailed by the scholars of Europe. It represented the other parts of what was afterwards named the *Organon*, recently brought to Western Europe as translations into Latin from the Arabic of the Moorish Univer-

* *Munimenta*, II., 25, temp. Jac. II.

† *Munimenta*, II., p. 26.

sities of Spain, and partly also from Syria and the East. To the theory of Terms and Classification, it added the valuable principles of Syllogistic and Demonstration, and a theory of Fallacies. These were properly regarded as parts of Logic, or the Science of Method—the Instrumental Science—and marked off from 'Philosophy,' which comprised Physics, Astronomy, and what we should now call Psychology, and Metaphysics. The whole works of Aristotle were thus comprehended in the curriculum of study, a body of thought and knowledge which was not within the reach of any one in Western Europe until the time of Alexander de Hales (1245), and which was not spread over the continent until the period of the writings of Albertus Magnus (d. 1280).

The reference to the text of Petrus Hispanus with the *Syn-categorematics* is also significant. The text is, of course, the *Summulæ Logicales*, a work of the thirteenth century. It is divided into seven tractates, the first six of which may be regarded as representing both the 'old' and the 'new' Logic; while the seventh section or tractate, on the properties of Terms, contained an addition to these in the shape chiefly of grammatical discussions, and was known as *Logica Modernorum*, or Modern Logic, as opposed to the *Logica Antiqua*, which included both the *Logica Vetus* and the *Logica Nova*. For the close student of the development of Philosophy and Theology in the Middle Ages—and we are now in great measure the heirs of the language and the discussions of that epoch—these points, small as they appear, are of deep interest. The grammatical discussions introduced into Logic by Hispanus indicated the new nominalistic tendency—a protest against an abstract notionalism—which, developed subsequently through Duns Scotus and William of Occam, led to the severance of Philosophy and Theology. This meant the setting up of a portion of knowledge, that regarding the Trinity, the Incarnation, Immortality, &c., as truths of Faith indemonstrable by Reason; and this led to new efforts to bring Philosophy and Theology into unity. As Nominalism naturally resulted in sense-impression as the last criterion of reality and truth, the question at once arose as to whether these truths of Faith had any warrant but that of dogmatic authority—whether they were to be regarded as having a scientific or philosophical basis. We can readily see here the forecasting of that Modern Philosophy and Theology which began with Descartes.

The *Organon* and the other works of Aristotle continued to be the staple of instruction in the Universities of Scotland, all through this and the succeeding century. In fact, the prevailing influence of Aristotle continued through the whole time of the Regents down to the final institution of the Professoriate at

the commencement of last century. But it gradually ceased to be exclusive. Up to the period of the Scottish Reformation it was absolutely dominant, and its power was only partially broken by that event. The Universities themselves with which Aristotle and the old Church were associated, suffered greatly both before and after 1560. Indeed, the type of the old mediæval University may be said to have ceased to exist in Scotland after the Reformation. The system of regenting as opposed to the professoriate was nearly all that remained of the old organisation. When Glasgow and Aberdeen were restored, there was a considerable change for the better in the subjects of instruction. Through the influence of Andrew Melville and Arbuthnot, a new life was breathed into Glasgow, St. Andrews, and Aberdeen. Melville inspired Arbuthnot; and Melville may be taken as the type of the new spirit of the time. He represented the new religion, the reviving classical culture, knowing Greek, Latin, and Hebrew, and while he was alive to the new influences in Philosophy, he was considerate enough to recognise the value of the old. Into Glasgow, in 1574, he introduced Greek, and in "*Morall Philosophie*" he taught besides the *Logic* of the time, the *Ethics* and *Politics* of Aristotle, the new *Dialectic* of Ramus, the *Rhetoric* of Talmæus, the *Offices* and *Tusculans* of Cicero, and certain of the *Dialogues* of Plato.* Henceforward, Philosophy in the Scottish Universities meant a greater breadth of study and culture. We see the beginning of those æsthetical inquiries which afterwards resulted in such books as Campbell's *Philosophy of Rhetoric*, and the writings of Gerard, Hutcheson, and Blair. James Melville, who continued the teaching of his uncle in Glasgow, tells us that he himself was the first Regent in Scotland who read Aristotle in the original. Up to that period, 1575, the philosopher was known only in the translations of Boethius, and in the Latin versions from the Arabic and partly from the Greek of the scholars of Constantinople. After the time of James Melville, we find express injunctions for the reading of Aristotle in the original, and its *viva voce* exposition by the Regents. The influence of Melville and Arbuthnot on Glasgow and Aberdeen was felt in those Universities for the best part of half a century; but there can be no doubt that the Scottish Reformation was not favourable to the progress of letters or philosophy either in the Universities or the country. The leaders of the Reformation were learned alike in Classics and in Scholastic Philosophy. But their successors gradually narrowed to a form of religious thought, which set authority as high as the old Church itself, and re-acted badly on the cul-

* See James Melville's *Diary*, p. 38.

ture of the times.' The Universities were 'purged' of all adherents of the old faith, and many cultured men were sacrificed, probably as a rough necessity, to the cause of civil liberty. Yet, had the scheme of Knox been carried out, and any considerable part of the endowments of the old Church been given to the Universities at the Reformation, letters and philosophy would have suffered but little in the long run. As it was, the lands of the Church which were truly national property, the offerings of the piety and the fears of four centuries, were appropriated under the convenient process of 'Commendation,' by a rapacious and illiterate baronage to their own purposes, in a self-constituted Parliament. The only endowments of the Regents, while acting as teachers, had been their Church benefices; and as these were no longer available, the University offices fell in emolument and in attraction for capable instructors.

Then in the succeeding century, during the time of Charles I., there arose those civil and theological contentions under which neither letters nor philosophy could be expected to thrive. Yet to the Assembly of Divines at Westminster (1643), where the theological debates culminated, and fermenting ideas were crystallised, Scotland sent its fair proportion of able and learned men. There Henderson and Gillespie showed, as Rutherford did at home, that the characteristic tendency of Scholastic Philosophy—the application of Dialectic to Theology—was still vital in Scotland. For the fervid zeal which inspired the great and subtle debaters of the period from 1638, through the Westminster epoch, and down even to the Revolution of 1688,—the Covenanters, the Engagers, the Remonstrants, the Resolutioners,—was pointed to a sharp edge by the Dialectic of Aristotle, as it had been learned in the Universities of the country. Nor can it be disputed that the theological formulas, adopted by the Scottish Church and Estates of the time, show evident marks of the application to Christian doctrines of the dominant and somewhat verbal metaphysics of the age.

In the General Assembly of 1639, in which the Covenant was re-affirmed and the covenanting party was for a second time triumphant, it was resolved that "all masters of Universities, Colleges, and Schools, all scholars at the passing of their Degrees, &c., subscribe the same".* This was pretty thoroughly carried out by a Commission of Visitation between 1639 and 1642, which was employed to ascertain "how the doctrine is used by their Masters and Regents, and if the same be correspondent to the Confession of Faith and Acts of this Kirk". But in truth each dominant party and government in turn applied its test to the Universities; and there was a

* *Peterkin's Records*, p. 208. *Burton's History of Scotland*, VII., p. 81.

similar 'purgation' and deprivation from office of the teaching Masters, by means of the test of the Assurance and Confession of Faith, under William and Mary, as under the party of 1639. Both the Church and the Parliament sought to control the subjects and matter of teaching—especially in Philosophy. There was no doubt a profession of consulting with the Masters as to course and subjects of study; but the real power lay with the General Assembly and the Estates. They reserved the right, real or assumed, of final judgment and determination both as to subjects and doctrines of Philosophy.

The Commission of Visitation of the General Assembly, of date 3rd August, 1640, recommended, on the suggestion of the Masters of the University of Glasgow, "that, the first year, beside the Greek tongue, there be a compend of Logic taught; the second year, beside the ordinary task (*i.e.*, Logic), *Περί Ἐμπνεύσεως* be taught, with the elements of Arithmetic; the third year, with what used to be taught (*i.e.*, Ethics), that the fifth and sixth Books of Aristotle's Ethics be gone through, with a compend of Metaphysics, and that Arithmetic be proceeded with, and Geometry taught; the fourth year, with the ordinary task (*i.e.*, Physics), Aristotle's book *De Anima*."*

In 1647-48 the Universities, feeling apparently the inconvenience of the power, nearly absolute, which the Assembly of the Church assumed over them, and put sharply into practice, formed themselves into a sort of common University Court for the country, to which each University sent commissioners. They met at Edinburgh, and, among other points, resolved that "it was found expedient to communicat to the Generall Assemblie no more of our Universitie affaires, but such as concerned religion, or that had some evident ecclesiastick relatione". The same commissioners adopted measures for promoting a correspondence among them, and a uniform course of study. On the 30th August, 1647, they resolved as follows:—"It is fund necessar that there be a *cursus philosophicus* drawn up by the four Universities and printed, to the end that the unprofitable and noxious paines in writeing be shunned; and that each Universitie contribute thair travellis thairto, and it is to be thoct upon, against the month of March ensewing, *viz.*, that St. Andrews tak the Metaphisicks; that Glasgow tak the Logicks; Aberdine the Ethicis and Mathematickis; and Edinburgh the Physicks".

Nothing seems to have come of this proposal at this time, or for some years afterwards. The thirteen years of civil and ecclesiastical struggles which followed—marked by the execution of the King, the battle of Preston, the death of Montrose, the battles

* *Munimenta*, I., p. 454.

of Dunbar and Worcester—turned men's minds from *Cursus Philosophici* to matters of another sort. Shortly after the Restoration, in 1664, the idea of a common course of Philosophy was revived. After various negotiations between the Commissioners of Parliament and those of the Universities, a final agreement was come to in 1695. But the Commissioners of the Universities were resolved that none of the compends should be of foreign origin. They tell the Commissioners of Parliament:—"It is altogether dishonourable to the Universities, and the famed learning of the nation, that a course of Philosophy shall be made the standard and course by authority established, which non belonging to any of the Universities have composed".* They further criticise very sharply the existing books and systems of Logic and Philosophy. The existing courses of Philosophy are either not intended and suited for students, or they are in themselves objectionable. "The course that runs fairest is *Philosophia Vetus et Nova*,† which is done by a popish author, and smells rank of that religion; but therein the Logicks are barren, and nothing of the Topics, the Metaphysicks barren, the Ethicks erroneous, and the Physicks too prolix." Neither the Logic of Derodon nor of Burgersdieck is to their mind. "Henry Moor's Ethicks" cannot be admitted. They are "grossly Arminian, particularly in his opinion *de libero arbitrio*". The *Determinationes* and *Pneumatologia* of De Frize [Vries] are too short. Le Clerc is "merely scepticall and Socinian". "For Cartesius, Rohault, and others of his gang, beside what may be said against their doctrine, they all labour under this inconvenience—that they give not any sufficient account of the other hypotheses, and of the old philosophy, which must not be ejected."‡

Accordingly, the University of St. Andrews was appointed to draw up the "Logicks and General Metaphysicks"; to Edinburgh was assigned the "Pneumatologia or Special Metaphysics"; to Glasgow was given the "General and Special Ethics," including Economics and Politics; the two Colleges of Aberdeen had charge of the "General and Special Physicks". The treatises were completed and given in to the Commissioners of Parliament in 1697, who were to have the power of revising and adjusting them. Two of the treatises at least were printed in London in 1701. The one prepared by Edinburgh is entitled *An Introduction to Metaphysicks* (pp. 56); the other by St.

* Printed in *Munimenta, Un. Glas., II., 530.*

† This, I presume, is the *Philosophia Vetus et Nova ad usum Scholae accommodata in regia Burgundia olim pertractata. Parisiis, 1681.* In four volumes.

‡ Printed in *Mun., Un. Glas., II., 531.*

Andrews, *An Introduction to Logicks* (pp. 56). The former, like the metaphysical digests of the period, does little more than arrange and define a series of notions. It contains, however, some acute remarks, especially on the terms Finite, Infinite, and Indefinite. The logical compend is based chiefly on the *Logic* of Port Royal. It is fresher and abler than the corresponding tractate on Metaphysics, and discusses well the accepted doctrines regarding Propositions, especially the rules of Quantity and Conversion. After 1701, nothing more is heard of the project; and it had no practical effect on the course of philosophical teaching in the Universities. It failed, as it deserved to do.

These opinions and compends may be taken as the last word of the Regenting system, and of the older philosophical teaching of the Scottish Universities. This system had given a high dialectic culture, and led to accuracy, precision and consecution of thought. That the sensibility was not largely cultivated, or the imagination enriched, was no inherent fault of the system itself. The branches of studies which should have provided for these important purposes, were either not existent, or they were not fully recognised. It accomplished at least what was its proper aim: that it was too exclusive, was to be charged to the general arrangements of the Universities. Its defect as a system of thought was that it had gone chiefly in one groove of study—a circle without forward progress. Advance of theory upon theory there was none; and many of the philosophical questions of deepest human interest had been left really untouched. The first half of the eighteenth century witnessed the introduction of the Professoriate, and with it there arose a freer, larger, more philosophical spirit. Ethics obtained a scientific basis and treatment at the hands of Gershom Carmichael and Hutcheson; and Psychology and Metaphysics assumed a new form in the writings of Reid. This modern period must, however, be left for another opportunity of discussion.

JOHN VEITCH.

(To be continued.)

IX.—CRITICAL NOTICES.

The Functions of the Brain. By DAVID FERRIER M.D., F.R.S. With numerous illustrations. London, Smith, Elder & Co., 1876.

IN this eagerly looked for work Dr. Ferrier gives a systematic exposition of his own experiments on the functions of the brain, with a critical digest of the results of inquiry into the cerebro-spinal system generally. Struck, as every one must be, with the discrepancy and even glaring contradiction among the results obtained by different inquirers, he yet contends that by carefully directed experiments on animals the foundations of a sure knowledge of the brain-functions can be laid. Accordingly, though he allows that much still remains to be done, he does not hesitate to put forward a body of results, original and collated, which are by no means wanting in definiteness.

The book as a whole cannot but enhance Dr. Ferrier's reputation as an investigator of remarkable acuteness and power. While following with great pertinacity his own very engrossing line of enquiry, he has managed to keep his eye upon the work of contemporary investigators at home and abroad, at least such as bears most directly upon his own. He has, moreover, by intelligent psychological study, fitted himself to probe questions which the most accomplished physiologists that are nothing more are apt to pass by or misunderstand. His physiological results have been obtained with great skill, and, whatever may be said against his interpretations, they are at once clearly conceived and forcibly argued. It is little to say of both that they must henceforth be reckoned with, by psychologists as well as physiologists, for any doctrine of brain in relation to mind.

The first three chapters, dealing with the structure of the brain and spinal cord and the functions of the cord and medulla oblongata, contain nothing particularly new, and may be passed over with the single remark that the author by decisively rejecting the notion that up to the medulla there is anything but "non-sentient, non-intelligent, reflex mechanism," enables the reader to anticipate with some probability his view of the working of higher centres short of the highest. He does, in fact, as the occasion arises, conclude of each higher centre in succession that there is no evidence of its action having a subjective phase till we come to the cortical substance of the brain itself, where the subjective concomitant seems too apparently present for any argument to be thought needful. It should, however, be noted that in his arguments he takes little or no account of the view that there are unconscious and semi-conscious states that may still be called mental or subjective, and are presumed to be in relation with the neural processes of lower centres. In so doing he might, doubtless, plead the example of not a few psychologists; still one could wish that a view which has received not a little support from physiologists had been considered by the way.

When he reaches the mesencephalon (corpora quadrigemina with pons) and cerebellum, Dr. Ferrier is first called to compare the varied researches of others with original (not merely testing) experiments of

his own. The centres just named are in relation not only with the multitude of efferent nerves ending under the skin or in deeper-seated parts, but also with the visual and auditory nerves of special sense : and there is given (in ch. iv.) a very careful and distinct account of the variety of impressions that are received and transformed into complicated motor impulses after removal of the cerebrum in animals. It is true that, as the grade of animal life is higher, the action of the lower centres is less independent, and the disturbance of their function on removal of the hemispheres is greater. Still the evidence forthcoming from experiments on animals, supported as they are by clinical observations on man, leaves little doubt that the mesencephalon and cerebellum are specially involved in the three great motor functions of equilibration, co-ordination of locomotion and instinctive expression of feeling. Dr. Ferrier's own experiments, by electrical irritation of the optic lobes in animals, seem to establish that the corpora quadrigemina (with the pons) are concerned in all these functions, but more especially the last two. The cerebellum, by the same means, appears as the great centre of equilibration, dependent as this function is on the reception of extremely varied impressions, tactile, visual and auditory (from the semi-circular canals). At the same time, the cerebellum is not so exclusively possessed of this function as that the cerebral hemispheres do not participate in it, and thus equilibration may be maintained in spite of cerebellar decay, especially when this is gradual. There is no evidence (any more than for still lower centres) that the cerebellum, great and developed as the organ is, has for itself aught to do with conscious sensation or voluntary emotion. Neither has it any relation (as was supposed) to the sexual function.

Passing now to the cerebral hemispheres, the treatment of which occupies two-thirds of the whole work, Dr. Ferrier first explains the methods which, as practised by Hitzig and himself, may be said to have opened a new era in the history of brain-investigations. He sufficiently justifies his own method of faradisation by the side of Hitzig's galvanisation, and then defends their joint conclusions against the objections urged by various later experimenters. The defence is too perfunctory considering the eminence of some of the objectors, Hermann not being noticed at all and Dr. Burdon Sanderson being only partially met; and this is the more to be regretted, because the original position is one for which not a little can be said. When it is uniformly found that electrical stimulation of contiguous small areas of the cortical substance results in perfectly distinct movements of limbs, &c., it seems impossible to doubt that the areas (or some of them—more exactly determined by a supplementary process) are quite specially concerned in the actuation of the movements; and they may not improperly be called motor centres, as the ultimate seats whence the different motor impulses proceed, if none higher can be assigned in the whole nervous system and it is not denied that centrifugal fibres conduct downwards from them to lower centres, and so to the muscles. It is the fact, too, as Dr. Ferrier does not fail to urge, that such an interpretation of the experimental phenomena only bears out

the clinical conclusions previously forced upon Dr. Hughlings Jackson in his protracted study of localised convulsive movements in man. We need have no hesitation, then, at least in taking the experiments as a clue to the resolution of the functions of an organ which else in its complexity quite baffles scientific analysis, and may now proceed to see how far Dr. Ferrier's methods carry him.

He first offers a simple record of the results of electrical irritation applied to the hemispheres and to the basal ganglia (*corpora striata* and *optic thalami*) in a great variety of animals from monkeys to frogs and fishes. The irritation, it is now well-known, as applied at different parts, more or less definitely limited in each animal and homologous in the various kinds, results in movements special or general, or in nothing at all that is manifest. Then arises the question of interpretation. Movements, as Dr. Ferrier says, "may be the result of some conscious modification incapable of being expressed in physiological terms, or they may be reflex, or they may be truly motor in the sense of being caused by excitation of a region in direct connection with the motor parts of the *crus cerebri*." To decide then, in each case, what is the real character of the movements determined from excitable areas, or to judge what may be the function of the regions that are not excitable, other experimental light is wanted. Dr. Ferrier accordingly resorts next to localised extirpation (chiefly by cautery), and in order to have results, as nearly as may be, applicable to the human brain, he operates chiefly on monkeys with brains approximating to the human type.

He finds, then, from both processes together, that while there is a region that may be described generally as bounding the fissure of Rolando (more particularly the ascending frontal and parietal convolutions with the postero-parietal lobule), the destruction of which causes complete motor paralysis of the other side of the body without loss of sensation, there are other regions the destruction of which causes loss of sensation without affecting the powers of movement. These latter areas, or sensory centres as Dr. Ferrier calls them, lie for sight and hearing (angular gyrus and temporo-sphenoidal convolution respectively) just behind the great motor region; for taste and smell (apparently together at the base of the temporo-sphenoidal lobe) below the others; and for touch (hippocampal region) on the inferior convoluted surface where it turns inwards. The "sensory centres" with the more forward "motor centres" occupy the whole median region of the brain, corresponding with the areas excitable under electrification. Behind are the occipital lobes bounding the hemispheres backwards, and these yield no positive result upon stimulation, but destruction of them appears to Dr. Ferrier to involve the loss of organic or systemic sensibility. On the other hand the extreme frontal convolutions, which also are not excitable by electrical stimulation, appear when destroyed to carry with them the power of attentive and intelligent observation or the controlling functions of intelligence. As for the basal ganglia, the *optic thalami* prove to contain the upward paths of sensory impressions, and the *corpora striata* the downward paths of

motor impulses ; and the two are so connected as to have a certain independent action, apart from the hemispheres, especially in animals lower than the monkey ; but they are in no case sensory and motor centres like the convolutions.

In this summary statement, which seeks to bring together the salient points of Dr. Ferrier's view of the different parts of the brain, it is the doctrine of definite sensory (and motor) centres that most calls for remark. His view of the basal ganglia needs to be strengthened by farther research, anatomical and physiological, though it seems not improbable, founded as it is on original experiments and acute criticism of extant results. As regards the functions of the occipital and frontal lobes, his views require much more elaboration before their psychological import can be seriously estimated : indeed he does little more than throw out a suggestion as to the occipital lobes, one too that is contradicted, or at least not supported, in a striking instance to which he very fairly gives prominence ; while his supposition as to the working of the frontal lobes has none of the precision that marks the corresponding doctrine of Attention (to which he refers) advanced in Wundt's *Physiologische Psychologie*. But there is certainly no want of definiteness in his assertions respecting the sensory and motor centres lying between the two uncertain regions. Neither, it must be said, is his method of procedure in determining which of the excitable areas are properly motor, and which are only indirectly motor (thence, by inference, sensory), at all wanting in circumspectness. If it is the case that the motor powers remain intact when any part of the brain except a certain region is destroyed, and that they vanish when this region is destroyed and this only ; again, within this region, that particular movements are maintained or lost as certain definite areas and these only are left intact or destroyed ; while, once more, direct electrical stimulation of the same region and its included areas results always in the very movements, general and special, that are lost by their destruction ;—one does not see how the conclusion is to be avoided that this region and the areas within it are the true centres whence movements generally and the particular included movements are, as movements, originated. What meaning is there else in the notion of 'centre' applied to the brain, when (as before said) there is nothing higher upon which the cortical substance is dependent ? Take now a particular area lying just behind. Let it be found that stimulation of this results in certain movements involved in the normal working of a particular organ of sense—say the ear. Let it then be found that, this area and this area only being destroyed, complete deafness ensues, but the animal retains all its other senses and its powers of movement unimpaired. Again the conclusion is inevitable that here is a part of the brain which is, to say the least, involved in the sense of hearing as no other part can be, and which may even, with some show of propriety, be called a centre for hearing because there is no higher seat in the cortical substance to which the sound-impressions are carried as they are carried to this one. Of course it should only be after a most varied series of experiments that

any scientific mind could dream of making such an exclusive statement, the circumstances that have to be eliminated being extremely perplexing, whether as arising from the fact that there are two hemispheres with a supplementary if not compensatory action in each as regards the other, or from the fact that presence or absence of sensation can after all only be inferred from motor re-actions as present or absent. But a candid reader will hardly deny to Dr. Ferrier the credit of having been fully aware of the experimental difficulties, and of having at once honestly and skilfully faced them. What then is to be made of his assertions? Does he prove his case either at all or in the sense for which he contends?

The very definiteness of the view—that extreme simplicity which will make its fortune—is in truth what most arouses suspicion. Not only do other inquirers find direct experimental evidence that the cerebral functions are involved with one another over the hemispheres in the most intricate fashion, but it also seems clear on a variety of grounds that the brain cannot be the simple aggregate that Dr. Ferrier suggests. In the way of direct evidence we have, for example, Goltz declaring, on the strength of new and careful experiments, that removal of *any* considerable portion of the cortex in dogs is uniformly and permanently attended by reduced skin-sensibility, impaired vision, and weakened muscularity on the opposite side of the body.* If this be so, either there is no special localisation of motor and sensory functions, but they are mixed up over the cortex, or at least the different localised areas are much less independent than they have seemed to Dr. Ferrier in the ardour of new discovery. One cannot indeed, in hesitating to go all lengths with Dr. Ferrier, straightway adopt the former alternative and refuse to go with him at all, as Goltz seems to do. His experiments are much too exact and varied to be overturned by a different class of experiments not as yet equally varied or exact: they can be refuted experimentally, one would think, only by some inquirer who will perform them all over again and show that they have been at every step misrepresented or misinterpreted by Dr. Ferrier. And this is hardly to be expected, more especially as there is no intrinsic improbability—rather the reverse—in the view, that impressions received by any organ of sense are all carried up first to a particular region of the cortical substance before they are brought into relation with other impressions and with motor impulses, or are otherwise elaborated in the brain. It may well be that there are special sensory regions in the brain-cortex, and that Dr. Ferrier has given the first rough indication of their locality. But even apart from conflicting evidence, seeing what the brain is, and the work it

* Dr. Ferrier has a supplementary note (to chap. ix.) upon Goltz's experiments and makes light of them, partly on the ground that Goltz was evidently unacquainted with his researches on the brains of monkeys as already published in abstract (*Proc. Roy. Soc.*, 162) early in 1875. It certainly lessens the value of Goltz's paper (reported on *infra*, p. 108) that he makes no reference to Dr. Ferrier's later researches, but that these "satisfactorily account for the phenomena," described by Goltz is more than can be allowed.

has to do, one must gravely doubt whether there are such sensory centres as Dr. Ferrier supposes.

Let it be granted that destruction of the hippocampal region in one hemisphere abolishes tactile sensibility in the opposite side of the body. It is not therefore proved that only touch is thereby affected, or that all tactile representations are blotted out of mental being, as Dr. Ferrier conceives of his "sensory centre" (chap. xi. *passim*). Peripheral impressions may be utterly prevented from coming into consciousness by the cortical lesion; but it does not follow that the last act of the nervous process involved in a conscious sensation of touch is naturally consummated there and nowhere else in the brain, or that in all that region there is no work done but such as (subjectively) we call touch. On the one hand, the cortical substance is thick and histologically by no means uniform in the direction of its thickness: what may be transacted in or through the hippocampal area besides what there happens for touch, Dr. Ferrier's experiments do nothing to tell, except only that other sense-impressions are not there directly cut off. On the other hand, touch (especially if understood, as Dr. Ferrier understands it, to cover besides skin-sensibility of every kind all that others mean by the muscular sense) is a function so extremely wide, being commensurate with the whole of objective knowledge presentative and representative, that to think of it as localised in one single convolution of the whole brain is almost ludicrous. Even to suppose that all tactile impressions, coming by such a multitude of nerves, pass first to this one place is a considerable draft on belief. But assuredly the whole work of touch is not so transacted there as that the area can with any propriety be called the exclusive centre of the sense. And the like must be said of the other all-pervading sense of sight which Dr. Ferrier would locate in the angular gyrus as a definite centre; as also of the sense of hearing, related as this is, through being involved in speech, to all that is most general in knowledge.

On the whole, then, it seems impossible to allow that Dr. Ferrier has done more than take a first step towards discovering the relation of different parts in the brain; nor is it possible to say thus far that much psychological insight is likely to be gained upon the new line of inquiry. Certainly, although he gives us in chap. xi. a view of "the hemispheres considered psychologically" which is much above the level of common physiological opinion, it does not appear to depend specially upon his own investigations. And that we are now put in the way to obtain a truly scientific phrenology, embodying what was true in the old phrenological doctrine (the notion of definite organ for definite function) but based, as that was not, upon exact anatomical and physiological inquiry in relation to exact psychological analysis—this, which is becoming a fond conviction with many, is, to say the least, a very premature hope. In some respects, the old phrenology was itself more scientific than that which would now be substituted for it. The 'faculties' it supposed were, many of them, such as might well be conceived to be distinctively organised in the brain; though psychological analysis had little difficulty in proving them to

be not ultimate functions but only varied aggregates of the true elements of psychical life. Far otherwise is it with the elements themselves, among which there need be no scruple to rank the various kinds of sensation. Differentiated as the organs of the senses are at the periphery, and distinct as the nervous channels of each must be till the convolutions are reached, sensations themselves as conscious states (each sort appearing at the presentative, representative, and re-representative stages, and all being liable to be associated or fused in every possible variety) can neither be supposed to be consummated at their first cortical station, nor be either traced or thought likely to be traced farther by any experimental means yet devised.

No space is left to deal with the many other points of psychological interest raised in Dr. Ferrier's important work; chief among them being his treatment of the so-called Muscular Sense, where he takes ground very decidedly against those who attach the consciousness of activity directly to the outgoing of motor impulse from the brain, apart from any backward report (by afferent nerves) of its effect in the muscles. I do not think he overthrows this doctrine, or by any means establishes the contrary one, which he advances in chap. ix., and then not seldom surrenders at the most critical junctures in chap. xi. But there is not a little force in some of his objections to the doctrine, and both these and the new light he throws upon the subject by experiment deserve the most careful consideration. This it may be possible to give on some future occasion, and the rather because the subject has become one of the first importance in the psychology of the present day.

EDITOR.

The Vocabulary of Philosophy, Mental, Moral, and Metaphysical; with Quotations and References for the use of Students. By WILLIAM FLEMING, D.D., late Professor of Moral Philosophy in the University of Glasgow. Third Edition. Edited by HENRY CALDERWOOD, LL.D., Professor of Moral Philosophy in the University of Edinburgh. London: Griffin & Co., 1876.

Professor Calderwood in a prefatory note says, "The fact that the *Vocabulary of Philosophy* by the late Professor Fleming soon passed through two editions, shows that it has supplied a want felt by those entering upon philosophic study". It would be difficult for any one who had carefully inspected the work to understand what philosophic want it can possibly have supplied. Vocabularies of Philosophy are generally of little value. From the very nature of the subjects which must be dealt with, absolute definiteness of statement is not to be expected. In small compass controverted questions cannot be handled to any purpose; and, as to quotations, it is unfortunately the fact that great writers seldom or never so arrange their doctrines as to render it easy for a vocabulary-maker to extract leading passages. The consequence of course is that the quotations are generally taken from abridgments or inferior compendia, while it is at the option of the compiler to insert passages which flatly contradict one another.

There seem then to be objections to any Vocabulary of Philosophy ; but, waiving them, it is undeniable that the compilation of a vocabulary which shall be of real service to students requires great care and rare qualities in the compiler. Such a work should at least be thoroughly accurate both in the all-important respect of philosophic doctrine and in the minor respect of references whether to books or authors. It should, further, be careful to give the definition of any peculiar term in the words of its author, and should rigidly exclude obsolete or unnecessary terms. In all these indispensable qualifications the present *Vocabulary* is singularly deficient. It is full of inaccurate references and misprints ; it is absurdly wrong in the statement of some historical facts and philosophical doctrines ; it seldom or never quotes a peculiar definition in the words of its author ; and it includes a multitude of terms that have no significance whatsoever in philosophy. These are heavy charges and can only be substantiated by detailed reference. The following are some of the principal blunders that have come under my notice : many more might be added under each head.

I.—Misprints or minor Errors :—P. 6, Dobriscb ; p. 28, Tyler ; p. 29, Sematologia ; p. 31, Kant's Antinomies badly stated ; p. 50, Trendelenburg *Note in Arist.* (and the note from Trendelenburg wrongly translated) ; p. 59, Bain's [Bacon's] Works ; p. 66, Cænes-thesis ; p. 69, Whatley ; Rosencranz ; p. 84, Savary ; p. 93, Bouvier ; Jaques ; p. 103, privy ; p. 213, *Nov. Org. I.* ch. [aph.] ; p. 262, Burke *Defence [Vindication] of Natural Science* ; p. 322, Baden, Pervill [Baden Powell] ; p. 334, Abailaird ; p. 391, universality, particularita ; p. 441, Mackintosh's *View, &c.* ; p. 474, *Critique du Jugement* ; p. 479, Stœudlin, *Hist. des Opinions, &c.*, [Stäudlin, *Geschichte &c.*] ; Tisset ; p. 498, Boeham [Boehme]. Let these few instances suffice by way of sample.

II.—Errors due to Dr. Fleming :—

P. 27. "Analytics is the title which in the second century was given to a portion of the Organon or Logic of Aristotle." Which second century ? Does not Aristotle refer to the *Analytics* by name ?

P. 27. "Animism is the doctrine of the *anima mundi* as held by by Stahl." Can Stahl's Animism be identified with the doctrine of an *anima mundi* ?

P. 41. "In the third century Porphyry wrote *Εἰσαγωγή*, or an *Introduction to Logic*." Is *Introduction to Logic* the title of Porphyry's *Isagoge* ?

P. 51. "The other form of Atheism in ancient times was that of Thales, Anaximenes, and Heraclitus, who accounted for all things by the different transformations of the one element of water." Did all three hold the same principle, water ? Can they fairly be called Atheists ?

P. 53. The article Atomism is one of the worst in the volume. (1) The theory is stated as if due to Leucippus : "Leucippus considered the basis of all bodies to consist of extremely fine particles." (2) The followers of Epicurus are said to have been the first to call

these particles atoms. Is this correct? (See Arist. *Phys. Ausc.* 265, b. 29.) (3) Epicurus is said to have added nothing to the doctrine of Leucippus and Democritus.

P. 70. Category is nearly as bad as Atomism. The explanation of what the Categories are is simply ludicrous, while the historical notices are most inaccurate. To take only the latter:—(1) The Stoic Categories are wrongly given. (2) Descartes is said to have two Categories, the absolute and the relative. (3) The *Port Royal Logic* is said to establish *seven* Categories. On what this assertion is based I cannot tell. The seven mentioned in the *Port Royal Logic* (I. c. 3) are referred to "some philosophers," and are treated with ridicule rather than approbation. (4) Kant's Categories are said to be well known and are enumerated as follows—*Quantity, Quality, Relation, Modality*. Nothing more is said, but the Editor adds a passage from the *Kritik*, which apparently is thought to be a definition of the Categories.

P. 118. We are told that "Aristotle gave the title of *Organon* to his Logic". Did he do anything of the sort?

P. 131. Dialectic is a bad article, bad in every way. How can students learn anything from a book which gives them the following? "The *Διαλεκτική* of Plato was the method of analysis by means of language, and comprised the field which his successor Aristotle separated into two, *viz.*, *Διαλεκτική* Logic, the enquiry concerning Method; and *Σοφία*, Metaphysics, the enquiry concerning being."

P. 132. We are told that "Aristotle says there are two kinds *διαλεκτικῶν λόγων, viz.*, *Ἐπαγωγὴ καὶ Συλλογισμὸς*". To the best of my knowledge Aristotle does not say so, and I should be glad to see the opinion extracted from the passages here referred to, *viz.*, *Top.* I. 10, and *An. Pr.* II. 23.

P. 235. Can any one understand the following explanation of what Kant meant by Immanent? "We make an *immanent* and valid use of the forms of the understanding, when we conceive of the matter furnished by the senses, according to our notions of time and space." What Prof. Fleming understood by this it would be hard to conjecture.

P. 282. Logic is mangled to a frightful extent. To go over all the errors contained in the article would be wearisome. We are told "The word *logica* was early used in Latin; while *ἡ λογική* and *τὸ λογικόν* were late in coming into use in Greek. Aristotle did not use either of them". On the following page we have the sentence: "At the beginning of the *prior analytics* Aristotle has laid it down that 'the object of *logic* is demonstration'". Both pieces of historical information are inaccurate; how they are to be reconciled, supposing they were correct, is hard to see.

P. 334. *Universalis in re* is said to be the watchword of the Conceptualists.

P. 359. "Sir W. Hamilton employs *perception* to denote the faculty, and *percept* the individual act of perceiving." Is this to be found in Hamilton?

P. 375. The following brilliant definition of Feticism is given. It is "the worship of anything that strikes the imagination and gives the notion of great power, which prevails in Africa and among savage nations in general". If this be so, I fear we must come under the wide category of "savage nations in general".

P. 401. Surely the Scottish student might expect to have an accurate account of the Quantification of the Predicate. There is not a word in the article to explain what is peculiar in the doctrine; we get only the old rules for the distribution of the predicate in affirmative and negative propositions, while it is vaguely said: "The Quantification of the Predicate is much insisted on by Sir W. Hamilton, *Lects. on Logic*, i."

The above are for the most part positive errors. For specimens of absurdity the reader may be referred to the heads:—

(1) Catalepsy—where appears the following naïve piece of criticism: "The paradox of Berkeley may be confuted in two ways:—first, by a *reductio ad absurdum*; second, etc." Surely this is better than the 'grin'. If Berkeley's doctrine can be reduced to absurdity, no further refutation is necessary. The second argument, it may be mentioned, is a fine example of *ignoratio elenchi*.

(2) Parthenogenesis—which runs *verbatim* thus: "Parthenogenesis, or the successive production of procreating individuals from a single ovum, is the title of a work by Richard Owen, F.R.S., Lond., 1849".

(3) Scholastic—where a new cause is pointed out for the fall of scholasticism. "The taking of Constantinople by the Turks, the invention of printing, and the progress of the Reformation, put an end to the scholastic philosophy. Philosophy was no longer confined to the schools and to pralections. The press became a most extensive lecturer, and many embraced the opportunities offered of extending knowledge."

(4) Stoic; (5) Suicide.

III.—No care is taken to give explanations of particular terms in the words of their authors. This is particularly noticeable in the cases of Leibniz and Kant. On the words Apperception and Monad, why is the student given Dr. Reid's account, and not referred to Leibniz himself? For Kantian phraseology, Haywood is generally quoted. Surely a *Vocabulary* published in 1876 ought never to refer the student to a book which was bad even for the time at which it was written, and which is now completely set aside by other works. If Kant himself is not to be consulted, there are very fair lexicons to his works published in Germany. It should be added that it is no uncommon practice with Dr. Fleming to give in French the Latin or German titles of philosophical works. The reason is perhaps not far to seek, but for the student English would be decidedly preferable, if the originals must not be given.

IV.—Of useless or obsolete words, the following may be taken as specimens: Adage, Adept, Adoration, Adscititious, Affinity, Apologue, Apology, Apophthegm, Autocracy, Blasphemy, Brocard, Chrematistics, Civility, Consanguinity, Divorce, Economics, Gnome, Metaphor, Me-

tonymy, Monogamy, Palætiology, Parable, Paradox, Philosomatist, Proverb, Sciologist, Sciomachy, Zoonomy.

It cannot be said that the errors are in all cases due to Dr. Fleming. The Editor himself is too often at fault. I do not think that any Kantian scholar would accept the account given (p. 72) of Kant's doctrine of Cause; certainly he could not accept the explanations of the important terms Constitutive (p. 110), and Regulative (p. 418). Constitutive, according to Prof. Calderwood, "is applied to knowledge verified in experience, knowledge whose object is found in the concrete". I venture to say that no such doctrine is to be found in Kant, and that such an opinion is wholly foreign to the Kantian system. It is too much to be told that "space and time are only mental forms regulative of the mind in its use of the sensory," and to be referred to a passage in the *Kritik* which emphatically states that they are not regulative, but constitutive. And what is to be made of this statement (p. 504)? "In Kant's sense, transcendental applies to the conditions of our knowledge, which transcend experience, which are *a priori*, and not derived from sensitive (*sic*) reflection." Dialectic (p. 130) is defined in a most arbitrary way, in a way for which there is not the slightest warrant. Spinoza's *Ethics* is called a Dialectic. German philosophers are credited with a view of Logic (p. 282) which a large proportion of them would reject; a clause is introduced into the definition of Miracle (p. 307) which is certainly open to question; and I doubt if Utilitarians would quietly accept the dogma (p. 343) that their moral theory involves necessitarianism.

If students are to have a *Vocabulary of Philosophy*, such a work ought to be drawn up with the utmost care. It is utterly worthless, worse than useless, if it be inaccurate and slovenly like this one.

ROBERT ADAMSON.

Vorschule der Ästhetik, von GUSTAV THEODOR FECHNER, Leipzig, 1876.

The announcement in the year 1871 of a contribution to experimental aesthetics from the pen of the author of the classic *Elemente der Psychophysik* excited, as the present writer well remembers, a good deal of curiosity in Germany. A people trained in an exclusively metaphysical discussion of art-problems might naturally be a little puzzled at the application to the subject of a method so thoroughly positive and exact as that unfolded in the *Elemente*. This essay in inductive aesthetics was a very modest one, being confined to the testing, by means of a convergence among distinct methods of observation and experiment, of Zeising's law of the Golden Section (namely that the division of a linear magnitude into two parts according to the formula $\frac{a}{b} = \frac{b}{a+b}$ is the one beautiful proportion for the eye). This law and its experimental verification are re-discussed in the present work. Fechner concludes that the Golden Section has a

special value though not the unique rank among visual proportions claimed for it by Zeising. Whatever significance the thoughtful reader may have been disposed to give to this result, he could not but be impressed by the excellence and promise of the method thus introduced into the region of aesthetic discussion.

In the two volumes of the present work Fechner has carried on his aesthetic researches to a much further point. The book does not profess to be a systematic treatment of aesthetics, but, as its title (borrowed from Jean Paul) suggests, to prepare the way for such a systematic construction. The aim of the writer is well set forth in the first two chapters. He defines his method of inquiry as that which works from below upwards, whereas in the prevailing German system of aesthetics the direction is exactly reversed. He does not wish to exclude the latter mode of construction, he merely contends that here as in physics the employment of the method from below is "one of the most essential pre-conditions" of a construction from above. With respect to the fundamental conceptions of aesthetic phenomena, Fechner is quite clear in referring all value in beauty and in art to a pleasurable effect, and he seeks to connect the idea of aesthetic worth with that of good in general interpreted by a strictly hedonistic, or, as he calls it, eudæmonistic formula. This part of the work will probably interest English readers not so much on account of its intrinsic qualities of clearness, penetration, and grasp of subject, as because it expresses the unqualified adoption of a theory of life so familiar in our own literature by a leading representative of contemporary German thought.

After thus paving the way for his researches, Fechner at once enters upon his main problem, namely, the determination of general aesthetic laws or principles. He clearly recognises that such laws if attainable at all must be capable of being brought under psychological principles. He begins by formulating six leading principles as a first instalment to a science of aesthetics. The first is named the principle of the "aesthetic threshold" or "lower limit," the second that of "aesthetic support" or "intensification". Then follow three laws which may be classed together as the highest formal principles, namely, that of "the unifying connection of the manifold," of "truth," and of "clearness". Lastly, we have a sixth aesthetic law under the name of the principle of "association".

The first of these, which might be termed the principle of a liminal aesthetic intensity, is merely an application to the particular effects of pleasure of a universal law of sensibility which the author has fully expounded in his *Psychophysik*. It finds an expression for the familiar fact that conditions which are of a quality to produce a pleasurable impression fail to do so if they are not at the same time of a certain quantity. Yet though a stimulus may be "below the threshold," if it is combined with other stimuli also pleasurable it may contribute an appreciable element to the result. This fact is expressed in the second principle of aesthetic support which is thus stated: "From these non-conflicting concurrences of conditions of

pleasure which of themselves effect very little, there arises a greater, often a much greater, pleasurable result than corresponds to the pleasure-value of the single conditions, or than could be explained as the sum of the single effects. More than this, through a combination of this kind a positive result of pleasure may be reached when the factors are singly too weak to pass the threshold."

It seems probable that this second law might be regarded as a necessary consequence from the first, by supposing that the combination of different sets of pleasurable conditions is equivalent to additions of intensity in one and the same set of conditions. Fechner makes most important use of this second principle in explaining the whole aesthetic effect of an object. More especially he points out that in the case of painting, and still more in that of poetry, elements of sensuous impression which of themselves would afford us but little if any appreciable delight may, by co-operating with the many associated ideas called up by the object, contribute a distinctly recognisable ingredient of pleasure.

In his third principle, that of the unification of the manifold (to which the following principles are very closely related), the writer is dealing with a more familiar proposition in aesthetics. Yet he manages to introduce considerable freshness into the exposition of it. What is more, he gives much greater precision to the principle by determining the extent to which each of its opposite aspects unity and variety may be emphasised to the neglect of the other, the most pleasurable ratio of the unity to the diversity, and the several modes in which each factor may be secured.

The treatment of the sixth principle, that of association, will interest English readers chiefly as placing the influence of association much nearer the point assigned to it by our own writers than where German aestheticians usually leave it. The author, not without reason, accuses his countrymen (with one or two exceptions, as Lotze) of almost wholly overlooking the part played by this "indirect factor" in aesthetic intuition. He illustrates the effect of association by a number of very interesting examples, travelling through the principal regions of art-impression as colour, visual form and tone, and devotes special sections to its influence in landscape and its bearing on the relation between painting and poetry. This part of the exposition is very attractive reading, showing the author's knowledge of art no less than his psychological insight. It is appropriately supplemented by a chapter devoted to an illustration of the influence of the direct or non-associative factor in the impression of music and of the visual arts.

The remaining chapters of the first volume deal with the experimental methods already spoken of, with the place of the idea of fitness in aesthetic appreciation, with the source of pleasure in witty comparisons, riddles, &c., and finally with taste, its varieties, and the laws of its development. The discussion of this last subject is particularly instructive. The conditions which favour the development of taste are carefully laid down, and a very creditable attempt

is made to define good and bad taste in relation to the eudæmonist's standard of value. This chapter may perhaps savour a little of an inclination to subordinate art to a purely ethical conception of life. Yet the idea is well reasoned and forcibly expressed.

The larger part of the second volume is devoted to the consideration of a number of art-problems which admit of treatment by means of the fundamental conception of art and the principles already defined. In this application of his theoretic premisses to circumscribed regions of art-discussion, the author is no less happy than in the construction of the principles themselves. He shows a very intimate acquaintance both with the points most ardently disputed among art-critics, and with the details of art itself, more especially perhaps those of the visual arts. In the opening chapter Fechner raises the question how far a work of art is to be estimated and criticised by help of a fixed conception of art, and makes the important distinction that, though the critic may reason safely from a conception of the function of art as a whole, he cannot safely reason from a notion of what a particular art has to achieve. The one aim of all artistic production is an immediate and adequate pleasurable impression, and even if "a work of art were to be produced which could not be brought altogether under any one of the separate arts, nevertheless so far as it satisfied the general aim of art, one would have to see in it nothing but a gain." Other rules for the guidance of criticism, no less valuable, are arrived at by a similar method.

The bearing of clear and scientific ideas of art on the practical problems which engage artists and their critics is well illustrated in a chapter which deals with the dispute between the assertors of the supreme value of form, and those who lay stress on the content or matter of art. Here the various possible meanings of form and matter in relation to art are carefully distinguished, with a view to define the problem. The antithesis is shown to be at best a rough and incomplete one, and ill-fitted for an adequate critical view of a work of art. Moreover, as might be expected, each of the opposed views is regarded as one-sided and misleading. The careful manner in which both form and matter are defined and analysed into their respective elements of pleasure with a view to assign each its right place in art, can only be understood by a reference to the chapter itself.

After disposing of the dispute between the champions of form and of content, Fechner deals with the other vexed question in practical aesthetics, that between realism and idealism. Has art to aim at a faithful portraiture of nature, or at a representation of an ideal which transcends nature? Here again the author is able by help of his leading conceptions of art to expose the one-sidedness of each of the rival views. The antagonism is bridged over and reconciled simply by a careful and thoroughly scientific discussion of the sources of value both in the imitation of nature and in ideal beauty. In other words, art has to seek truth and to seek ideality just because, and only so far as, each of these is a condition of a total pure and lofty

pleasure. The investigation of the psychological grounds of the value of truth and imitation deserves the special attention of the reader. It is a very valuable contribution to a scientific settlement of art-problems.* On the other hand, the conception of ideality in art, together with its precise value, is closely examined. Also, Fechner discusses the different modes of deviating from nature, which he reduces to three, namely, Idealisation, Symbolisation, and Stylisation, or conformity to the ends of good style. The ambiguity attaching to these terms is well set in light, and a very successful attempt is made to give them a precise connotation, and so to arrive at their proper value as functions of art. The result of this long and interesting investigation seems to be that according to a hedonistic conception of art, truth according to nature must be ranked much higher than is commonly the case in contemporary art. Fechner will probably be accused by many of having a decided bias to realism; yet his argument seems to me perfectly impartial and on the whole thoroughly convincing.

We must pass over certain chapters that invite delay, among which is one on the Sublime not unprovocative of some adverse criticism, to dwell on "a second series" of aesthetic principles too briefly expounded at the close of the work. These consist, like the first series, of laws which have a bearing on pleasure in general quite as much as on art-pleasure. They are psychological conditions of pleasure defined in relation to the peculiar effects of art. First of all come three principles relating to the best order of impressions, namely, that of aesthetic contrast, of aesthetic sequence, and of aesthetic reconciliation. The meaning of contrast as something over and above the result of the single contrasting impressions is well defined, and its conditions laid down. The obvious but aesthetically important observation is made that among sequent impressions the effect of contrast can show itself only in the consequent not in the antecedent. With this proposition there connects itself a second, namely, that a sequence in a positive direction, that is from maximum pain to maximum pleasure, is attended with a secondary pleasure, the result of contrast, while one in a negative direction (from pleasure to pain), is accompanied by a secondary pain: hence the aesthetic law that impressions should proceed in a positive direction. The value of the final reconciling impression, which is formulated under the third principle, is closely connected with this second. Here, however, Fechner seems for a moment to be forsaken by his customary comprehensiveness of view, since he makes no reference to the rather obvious consideration that the concluding impression, say of a tragedy, owes its importance not only to the effect of contrast and to its being

* The present writer will perhaps be forgiven for expressing his pleasure at seeing his own line of investigation almost exactly reproduced by such an authority in method as Fechner. The reader will find that Fechner's treatment of this question, more particularly the determination of the value of imitation as a source of pleasure in art, follows, unconsciously as it seems, the path roughly traced in the last Essay in *Sensation and Intuition*.

anticipated throughout a part of the previous impressions, but also to its being the impression which survives most vividly as an idea, and so most distinctly colours the after-recollection of the whole chain of impressions.

Next to these principles we have a number of others relating to the intensity and duration of pleasurable impressions, namely, the duration required for the full rise of an impression, the effects of repetition and exercise in improving an impression, the blunting result of undue prolongation and of too frequent repetition of impressions, the effects of habituation in producing a recurring want or desire, and the limit imposed on pleasure through the nerve's liability to exhaustion and the attending sense of fatigue or satiety. These principles are given as psychological truths, and not fashioned into special aesthetic laws. Moreover, they are touched on much too lightly to be of very much value, though the author succeeds in showing the way in which these several influences cross and modify one another. In another chapter we have, with somewhat more fullness of exposition, the important conditions of a certain amount of persistence and of change in the kind of mental activity, as well as a certain quantity of activity and change of degree in activity. Here Fechner teaches that, quite apart from the pleasurable character of the occupation, a certain amount of persistence in an activity once commenced tends to be agreeable, whereas beyond certain limits change becomes desirable. Also an activity is at an advantage when it has a sufficient but not excessive quantity or intensity, and a certain amount of change in the degree of activity is desirable.

After these principles follow others relating to the effects of the manifestation of pleasure and pain, and of what Fechner calls "the secondary pleasure and pain of representation". The "primary pleasure of representation" is that which flows from the act of representation itself, as a perception of unity, the secondary is that which follows from a representation of a pleasure, as another's enjoyment, our own past or future happiness. The conditions which limit and complicate the fundamental effect of ideas of pleasure and pain, namely, that to perceive or conceive pleasure is pleasurable, and so with pain, are set forth clearly and with sufficient fullness. Passing over a chapter on the principle of the aesthetic mean, which formulates the familiar truth that a medium average magnitude in objects, such as experience has rendered customary, is most pleasing, we arrive at a chapter which discusses the question how far all the conditions of pleasure can be reduced to one principle. Fechner thinks that as yet this is impossible except in a very hypothetical way. He is decidedly opposed to basing all pleasure on quantity of nervous energy, and the argument by which he seeks to refute this theory seems to me to be quite conclusive. He then briefly shadows forth the idea worked out in his *Einige Ideen zur Schöpfungs- und Entwicklungsgeschichte*, that all pleasure may repose on harmonious relations of form in the single nervous process or the combining processes, and that this harmonious relation is but a part of those stable arrangements which are the end of nature as a whole.

To conclude, one may safely guarantee the reader no ordinary pleasure in perusing a discussion marked alike by so much scientific impartiality and insight, as well as general appreciation of the aims and possibilities of art. His only regret will probably be that so much that is deeply interesting is touched with a seemingly hurried hand that lacks time to linger and do justice. Yet we must be grateful for all that Fechner's large experience and ripe thought have here given us, not murmur at what is wanting. To show the reader what Fechner's style is like, and that he is not altogether unworthy as a philosophic critic to follow his countryman Lessing, I cannot do better than conclude by making one short quotation. Arguing against the common tendency of artists at present to idealise or prettify all their figures, he writes:—

"In the wedding of a peasant girl, the bride may be represented as a pretty woman; for why exact from a painter to paint a marriage with an ugly rather than with a pretty bride? One would rather marry a pretty girl, one would rather paint such a one, and see her when painted. Where no interest attaches to a scene, it should not be painted at all, and for the most part the interest in a scene culminates in a person as a centre of relations. Now if the bride is pretty, not only she herself but all her surroundings gain in interest and charm. When however the peasant girl looks not only pretty but also fine, when the bridesmaids and the women looking on are all pretty, or at least have interesting faces, we have no longer a peasant wedding but only the masquerade of one, and all the relations lose in interest and charm through the feeling of unreality."

JAMES SULLY.

X.—REPORTS.

Functions of the Cerebrum.—In Pflüger's *Archiv* xiii. 1, Prof. Goltz of Strassburg gives an account (pp. 43) of an elaborate series of experiments he has recently conducted (with his assistant, Dr. Gergens) on the effects of extirpation in the region of the cerebral hemispheres. The special object of the research was to determine how far and in what way there ensues a compensation of function after the removal of parts of the hemispheres. Among previous inquirers the difference of opinion on these points is notorious. While Flourens went so far as to suppose that the least remnant of the cerebrum might suffice for the discharge of the functions of the whole mass, Carville and Duret maintain that the compensation is limited to parts of the same hemisphere, and Soltmann contrariwise declares that loss of the function of one part is made up at the corresponding part of the other hemisphere. Hitzig, again, differs from them all. Ascribing absolutely special functions to quite limited areas of the cortical substance, and these different for the two hemispheres, he can only suppose that restoration of lost function (which supervenes often with great rapidity) is due to the presence of some

unsuspected relic of the original area; thus denying symmetrical compensation between the hemispheres, and denying all but the most strictly limited compensation within the same hemisphere.

Goltz confined his research to dogs, and practised a new mode of experiment (detailed at length in the paper) whereby he avoids excessive hemorrhage, and can maintain an animal alive for months. It consists in washing out by a strong jet of water part after part of the cortical substance, the animal all the while being under chloroform; the greater blood-vessels thus escape rupture, and the animal recovers very quickly from each operation. In this way Goltz has been able to get rid gradually of the whole cortex of one hemisphere and keep the animal alive comfortably for weeks afterwards, while the effects, immediate and remoter, were under observation. These he disposes under three heads: disturbances of (1) Sensation, (2) Vision, (3) Movements. The degree of disturbance increased with the size of the area extirpated, but its character did not, as far as appeared, depend on locality, there being no difference whether the operation took place within Hitzig's 'excitable' region or far back behind it.

(1) By Sensation is meant the skin-sensibility in all its phases, for Goltz does not allow the distinction that Schiff and other physiologists would make out between sense of pain and sense of contact or pressure in the skin. This general skin-sensibility almost all inquirers have believed to be unaffected by destruction of the cerebral convolutions, though it is allowed to be temporarily disturbed by the operation. Goltz, on the other hand, finds that after partial or total extirpation of one hemisphere the animal never (at least as far as he has yet gone) recovers full tactile sensibility on the opposite side of the body, where just after the operation it appears wholly lost. The sensibility may often seem to have returned from the general demeanour of the animal, but careful experiment with pressure of weights shows that the skin on the side affected remains comparatively insensitive. This was clearly manifest everywhere except only on the side of the tongue.

(2) The effect upon Sight is distinctly marked, though it is peculiar. It is known that complete extirpation of both hemispheres (in frogs) does not prevent the performance of suitable movements upon visual impressions, and partial destruction of one hemisphere has commonly been supposed to have none but a temporary effect on vision (of the opposite eye). Goltz finds a permanent effect of a serious kind. The initial total blindness of the (opposite) eye, it is true, passes quickly away, and this happens even if the whole cortex of the one hemisphere has been destroyed; wherefore it must be supposed that each eye communicates with both hemispheres. But at the same time, the experiments seem to prove that the sight of the opposite eye is never quite recovered, if the whole or *any* considerable part of one hemisphere is destroyed. The animal is able after a time with this one eye to guide its movements well enough, and with the help of its other senses it manages to hold its own among its fellows, but the character-

istic emotional effects accompanying vision, *e.g.*, the fury dogs show at sight of strange objects, or fear on being held out of a window at a distance from the ground, remain quite absent. Goltz supposes that the sense of colour becomes faint and confused, also that the judgment of distance, &c., is affected; the animal's experience becoming something like ours in a mist. To note the effect of hemispherical destruction upon one eye, Goltz wholly removed the other eye, and his experiments strike one as well varied and carefully made. He does not seem, however, to have varied the experiment in one way that would have been useful—leaving both eyes intact but affecting each equally through the corresponding (opposite) hemisphere.

(3) Movements, as such, are seriously affected, but it is necessary here also to distinguish between mere passing effects and such as remain. The initial muscular helplessness on the side affected by the hemispherical lesion is after a short time so far made good that nothing unusual might be remarked, but it is easy to see when the animal is on a slippery footing that there is real weakness on one side. It is also found that the animal never uses the front paw on this side for any of the many uses to which it would naturally be put. So in dogs that are trained to present either paw at command, the power of presenting one is lost, and though this may after small destruction be slowly regained, it is lost altogether if this destruction be carried far: one and the same paw is then always presented, whatever the demand. Similar weakness is shown in all the muscles of the same side (except the tongue); nor, if the destruction is considerable in extent, does it matter whereabouts in the hemisphere it is. Some of the phenomena seem due to the general loss of sensibility noted under (1), but the inability, in spite of evident effort, to present the paw asked for, points to a real break between the organ of the will and the nerves that execute special volition. This must be so, although the muscles of the limbs, &c., are found to work effectively enough in the regular mechanical functions of walking, running, &c. As regards the one whole side of the body, it seems that there is a weakening of all the efferent processes under the control of the organ of conscious volition, because this organ, in as far as it is still present, appears to be connected with that side by less convenient channels than it is with the other side.

Goltz is thereby led to reject the theories of all his predecessors, and he believes that they in truth dispose of one another. Hitzig (and Ferrier, to whom he just refers) he especially charges with neglecting the difference between transitory and permanent effects: the permanent effects, as far as they are established, are of a kind not to be reconciled with the assumption of definite localised motor centres, however the limits of these be construed. Goltz's own view is that the restoration of function, after greater or less destruction of the hemisphere, is due to the cerebellum (which normally contributes to the action of the hemisphere) recovering from the stoppage temporarily caused by the operation and resuming its previous action. Thus is explained the fact that it is the mechanical movements of walking,

&c., which are chiefly recovered, these being the ones to which the cerebellum and related parts mostly contribute. But how as to the temporary stoppage of function? Here Goltz adduces a great number of facts and considerations to show that in all cases where higher centres are violently excited there is an inhibitory effect upon lower centres; but, if the higher centres be cut off from the lower ones, the inhibitory effect arising from the wound gradually passes away and the lower centres recover their normal function. It is such an inhibitory influence then that the cerebellum, &c., suffer from the cerebral lesion. Not till it passes away and these have begun again to function normally, can it be seen what is the actual loss from the hemispherical destruction. That this is very real appears from the experiments detailed above; and that it is ever compensated there is no reason to suppose. A new growth of brain-substance to supply the gap made does not take place in the higher animals; though what remains of the original cortex tends to spread out into the space left free.

Goltz promises to deal with the psychical effects of his experiments in another paper, but his present communication has no small psychological import in as far as it indicates the wide-spread character—practically the omnipresence over the hemispheres—of the nervous connections involved in touch, sight, and movements. As far as it goes, the research bears decidedly against the views of Hitzig and Ferrier, especially as now developed by the latter. And it is not less but rather more decisive that the *Ausfallserscheinungen* (as Goltz calls them) or permanent deficiencies of function are demonstrated—always supposing them really established—in dogs whose lower motor centres (as Dr. Ferrier argues, *Functions of the Brain*, p. 73) are much more independent of the hemispheres than in monkeys.

EDITOR.

The Laws of Dream-Fancy.—In the November number of the *Cornhill Magazine* the present writer has endeavoured to carry the physiological explanation of dream-phenomena as far as can be done in the present state of the science. Three problems arise in connection with the subject: (1) Whence come the vividness and apparent reality of dream-images? (2) What are the sources of stimulation from which the various contents of our dreams are derived? (3) What gives to our dream-combinations their peculiar form and order? (1) The *reality* of dream-images is accounted for through the absence of what M. Taine calls the 'corrective' of a present sensation. It is possible also that absolutely as well as relatively our dream-images are more lively than our waking imaginative representations. (2) The *sources* of dream-excitation have been investigated on the psychological side by Hartley, on the physiological by Maury, Wundt, and others. They may be divided into peripheral and central. The former include (a) objective sensations, properly so called (as illustrated by M. Maury's interesting experiments), (b) subjective sensations, together with (c) the feelings arising from the position and

condition of the muscles, and not least (*d*) those connected with the several organic processes. The central stimulations, again, may be divided into (*a*) the direct, which appear to arise immediately from some unknown influence excited by the contents of the blood-vessels on particular tracts of the brain, and (*b*) the indirect, or those effected through acquired cerebral connections or the bonds of mental association. (3) As to the *form* of dream-combinations, the least perfect and passive dreams owe their peculiar incongruity to the number and variety of the wholly disconnected sources of stimulation which simultaneously supply images to consciousness. More particularly the various degrees of irritability of the cerebral elements at the time serve very much to complicate and confuse the grouping of images and to explain why the ordinary paths of association traversed in waking hours are so seldom followed. In the case of the more elaborate and closely connected dreams, much of the verisimilitude arises from the action of organic dispositions or general tendencies of association which serve as so many rough forms of dream-thought. Such a general disposition would account for our attributing some kind of words and actions to the image of a man or woman which presents itself, though what the particular words are to be depends on the co-operation of the several existing causes already spoken of. Hence the mixture of a general reasonableness with a particular incongruity which marks so many of these dreams. Next to these influences, one must reckon the play of attention under the sway either of an impulse for rational unity, or of a dominant emotional tone somehow excited at the time, which tends to harmonise all inflowing images with itself. In the act of fixing attention on the internal imagery of our dreams we unconsciously modify it, selecting, adapting and fusing according to the pre-existent ideas or emotional tone. The emotional key which dominates so many of our dreams is fed by the effect of previous images and still more largely by the pleasurable and painful organic sensations of the time. The essay concludes with an attempt to explain, by a number of influences already touched on, the power of gradual exaggeration into which dreaming is apt to fall, also what the Germans (as Scherner and Volkelt) call the symbolic function of dreams, and lastly our usual non-recognition of the bodily sources of dream-impressions.

JAMES SULLY.

XI.—NOTES AND DISCUSSIONS.

On some alleged distinctions between Thought and Feeling.—In noticing the *Psychology* of Brentano in MIND, No. I., I dissented from his explanation of the difficulty of distinguishing in a satisfactory manner the ultimate generic facts of consciousness, and affirmed that the main cause of the failure of the distinctions which had been attempted to be drawn was not the impossibility of inner perception becoming inner observation, but the immense variety of forms in which the ultimate facts of consciousness manifest themselves. I referred in

illustration to the distinctions between Thought and Feeling laid down in Fleming's *Manual of Moral Philosophy*, Pt. I, Intro., ch. iii. I believe that Fleming has there brought together all the distinctions that are currently recognised as discriminating the intellect from the sensitivity, and that by indicating how superficial and untenable most, if not all, of them are, I shall show the necessity for a new and more thorough investigation of the relationship of these two great provinces of mind.

The first of the distinctions laid down by Fleming is, that "In cognitions, or the phenomena of intellect, there is a dualism which is not implied in feelings, or the phenomena of sensitivity. To know there must be an object of knowledge, and the *object known* is different from the object knowing. To feel is merely to experience a modification of self. A state of feeling is subjective and one. An act of knowing involves the antithesis of subject and object." Now, is this distinction tenable? It seems to me that it is not. Feeling no less than thinking is a fact of consciousness, a form of consciousness, and all consciousness involves a dualism. That is its primary condition. An absolute unity in consciousness is inconceivable. The terms of the relation may even in cognition be self and a modification of self; the object is not necessarily apart from or out of the Ego. But wherever there is consciousness there is relation, and wherever there is relation there is dualism, and to say that feeling involves no distinction of self and its modification is simply to deny that feeling is a form of consciousness. We can no more feel without feeling than we feel than we can know without knowing that we know. Feeling is not a something independent of that dualism which is the necessary condition of consciousness but a something superadded to it. It is not a something absolutely one. Were it so, it could not be a mental fact at all. If in any sense a unity, it is a unity which involves a dualism, which depends on a dualism for its very existence.

The second distinction laid down is, that "Cognitions are characterised as true or false; feelings as pleasurable or painful, agreeable or disagreeable". This is supported by a quotation from Reid which states merely that feelings cannot be expressed in propositions—do not affirm or deny, are not true or false, like judgments,—have not the qualities which distinguish judgments from all other acts of mind. But that certainly says nothing for Fleming's distinction. Judgments are one thing; cognitions are another. Judgments are only a kind of cognitions, and it is not correct to predicate of the genus, cognition, what is true merely of the species, judgment. Reid says the qualities of true or false distinguish judgments from all other acts of mind. If so, they distinguish them from a great many kinds of cognitions, from all varieties of simple apprehensions, and thus distinguishing judgments from other cognitions, it is manifestly impossible that they can distinguish these latter cognitions from feelings. It is, further, certainly not to be assumed that feelings are pleasant or painful, agreeable or disagreeable, seeing that many psychologists have held that, owing either to feebleness of impression or of the contact and counteraction

of pleasure and pain in an equal degree, they may be indifferent, and Prof. Bain has argued that emotion may exist even as excitement not pleasurable or painful.

The third distinction laid down is, that "Cognitions are permanent, invariable, and uniform, while feelings are fugitive and variable, and differ, not only in different individuals, but in the same individuals at different times". This is likewise quite untenable as a general distinction. There is a little truth in it but there is more error. Knowledge in the form of science may be, at least comparatively, "permanent, invariable, and uniform," but the cognitions of the individual are certainly not always so. Opinions like tastes are various. What seems true to one does not seem true to another, just as what pleases one does not please another. What seems true now may not seem true to the same person hereafter; and what seems false to him now may come hereafter to appear to him true. Perhaps cognitions are as a general rule more permanent than feelings. But that is all that can be said. Some feelings are more permanent than some cognitions. Nothing about us is more permanent than some of our feelings, some of our cognitions. This distinction, like the previous one, ignores the essential fact that feeling is not to be discriminated from thought by contrasting it only with some special form of thought, and especially not by contrasting it with the higher forms of thought. It is a distinction which may hold between feeling and scientific demonstration but it will hold equally between many kinds of thought and such demonstration. Fancy and imagination are exercises of intellect but they are as little permanent, invariable, and uniform, they are as essentially variable as any feelings can possibly be. Fleming has even gone further astray. "Knowledge may admit of increase, but not of variation. It may alter in amount, but not in nature. What is true now, remains a truth for ever. What is true to one, is true to all. It is the fixed and certain nature of knowledge which is the ground of all progress and improvement. But Feeling is unstable." In writing thus he obviously forgot that he had nothing to do in the investigation on which he had entered either with knowledge in itself or with truth in itself, but merely with the act or exercise of intellect called knowing or cognition. The question is, How does the mental state termed feeling differ from the mental state termed knowing, how does emotive experience differ from intellectual action? It is not how does feeling differ from truth, which is a something independent of the mind, nor how does emotive experience differ from knowledge, which is the reward of intellectual exertion, and a reward even which it may fail to attain. Apart, however, from this, the distinction, as I have indicated, breaks down. It is no distinction between thought as such and feeling as such.

The next distinction attempted to be drawn is, that "The operations of the intellect are confirmed, while the exercise of the sensitivity is weakened, by familiarity and reflection". It is a distinction still less tenable, if possible, than the preceding ones. Pass in review the different principles of action, the appetites, emotions, desires, affections,

and passions, and it will be found that with few exceptions they are intensified and confirmed by indulgence, and that the exceptions can be accounted for. Mere passive impressions weaken and deaden the intellect as well as the sensitivity, and real indulgence intensifies the sensitivity no less than it strengthens the intellect. Fleming admits that "the feelings connected with the affections of country, and kindred, and friendship," are confirmed by being long cherished, but accounts for it on the ground that "the elements which go to constitute these affections partake more of the intellect than of the sensitivity". The admission is, however, inadequate and the explanation incorrect. The fact admitted is just as true of the grossest and most brutal passions as of the honourable and generous affections mentioned. Does the drunkard's passion for strong drink not grow in intensity and strength with indulgence? And is his infatuated desire one the elements of which partake more of the intellect than of the sensitivity? The mere feeling accompanying its gratification may decrease, but the desire for gratification increases, and desire is a form of the sensitivity, just as much as the feeling. This distinction takes no note of that. The two previous ones erred by taking a species of cognition, the highest kind of cognition, for the entire genus, cognition; this one errs by taking a species of feeling, the lowest stage of feeling, or feeling proper, for the entire genus, feeling.

The fifth alleged distinction is, that "Cognitions are more firmly retained, and more easily and fully recalled and revived, than feelings". "An object of sense perceived," says Fleming in illustration, "a relation discerned, a conclusion come to, can be reproduced and represented to the mind, and made the means of increasing our knowledge. Feelings often pass away without leaving any trace behind them. When they are revived, it is very much in virtue of their being connected with cognitions. And they are revived in a form much less vivid than when first experienced." Now, it must again be remarked, that while we have to contrast feelings with cognitions we have not to contrast them with objects of sense perceived, relations discerned, or even conclusions come to, but only with the perceiving, discerning, concluding. But, apart from the inaccuracy which there is in what Fleming says from overlooking this, it is obvious that, even if all that he says were true, it would only be the statement of a difference not of nature but of degree. That is not, however, what it is presented as being, and it is not what is required. Thoughts differ from thoughts, feelings from feelings, in the same way in which thoughts and feelings are here said to differ. Some thoughts are much more firmly retained and more easily and fully recalled and reviewed than other thoughts, some feelings than other feelings. What thus distinguishes thoughts from thoughts, feelings from feelings, cannot distinguish thoughts from feelings. It is only, in fact, a distinction of nature that can have any relevancy or worth. The question is not one of more or less but of kind. Even as expressive of a difference of degree, what is said, if it hold, holds only in a very loose and general way. If feelings often pass

away without leaving any trace behind them, so do thoughts. It is our feelings, it may be even contended, which leave most trace behind them. And certainly there are feelings, I cannot but think, which exert a far more potent influence in determining what thoughts and emotions shall be experienced by us, a far more potent influence on the laws of association, than, perhaps, any cognitions. The influence of our general dispositions and tempers, and even of our varying moods of mind, in originating and directing, in shaping and colouring our trains of thought, is so vast and manifest that all observers of human nature have had their attention drawn to it. Hence, if it be true that "when feelings are revived, it is very much in virtue of their being connected with cognitions," it is equally true that when cognitions are revived, it is very much in virtue of their being connected with feelings. And there is nothing exceptional in feelings being "revived in a form much less vivid than when first experienced". The memory of a thing is never so vivid as the perception of it. Perception and memory, however, are both cognitive acts.

The sixth distinction laid down is, that "The intellect can entertain opposite ideas at the same time; but the sensibility cannot at the same time experience contrary feelings. The knowledge of contraries is one. He who knows what motion is, knows also what rest is; and the contrariety between them does not prevent us from thinking of them at the same time, but has the effect of bringing them into our thoughts together. But we cannot, at the same time, feel joy and grief, love and hatred; one feeling displaces another. Feelings succeed one another rather than co-exist." This likewise, even if true, tells us little or nothing as to the distinction between thought and feeling. To say that two contrary thoughts may come together but that two contrary feelings cannot, gives us almost no information as to wherein the contrariety of any one thought to any one feeling consists. But there is a more serious objection. It is only in abstract thought that contraries are known as one. In any single direct cognition, in perception, for instance, or internal intuition, contraries unite no more than they do in feelings. It is as impossible to have a perception of contraries at the same time as to have a sensation of them. There are, then, since perception belongs to the intellect and sensation to the sensitivity, a cognition and a feeling which this distinction is utterly incapable of discriminating. It does not enable us to distinguish every form of feeling from every form of cognition. There is another objection. If simple feelings are compared to simple cognitions, contraries will, as has just been stated, be found united in neither; but if complex feelings are compared with complex thoughts they may be found in both. It is contrary to the commonest experience to say that "the sensitivity cannot at the same time experience contrary feelings". There can be pleasure commingled with pain. There can be joy in the midst of sorrow. It is what poets without number since Homer, and philosophers since Plato have described. Children are both frightened and fascinated when listening to a ghost-story; the more 'tear-compelling' a tragedy or novel

is, the better it is generally liked. There must be a horrible combination of contrary feelings in the breasts of the spectators of an execution or a bull-fight. It would thus seem that in every way this sixth distinction is defective.

Pass to the seventh distinction. It is, that "A variety of ideas may sweep simultaneously or in close succession through the mind without losing their individuality, or mingling into one complex and confused idea. But when a great variety of feelings are experienced at the same time, they melt or mingle into one whole state of enchantment and delight, or consternation and pain." It is not necessary to repeat here the criticism made on the immediately preceding alleged distinction that it in no way discriminates between thought and feeling as such, between any one thought and any one feeling. It is enough to say that there is no warrant or reason for affirming that a great number or variety of feelings may not pass through the mind in close connection without coalition. As great a variety of feelings may be experienced without coalescing into a complex emotional state as of thoughts without their combining into a complex intellectual state. When a great number of thoughts pass rapidly through the mind, the same number of feelings in all probability do so likewise, every thought awakening a feeling. Where there is the coalescence of many feelings, it will generally, if not invariably, be found to have been preceded by the commingling of many ideas.

This brings us to the last distinction which is attempted, namely, that "In general, the cultivation of the intellect checks the development of the sensitivity; and *vice versa*, the development of the sensitivity is unfavourable to the exercise and cultivation of the intellect." It appears to me to be as unfortunate as its predecessors. It is, in fact, only stated to hold "in general". But what kind of a distinction is it which in a case of this nature only holds "in general"? It is one which does not always hold, a distinction which sometimes fails to distinguish, or in other words, no distinction at all. It is certainly not what it should be, a specific distinction between thought and feeling. It is no doubt true that "in general, the cultivation," meaning thereby the exclusive cultivation, "of the intellect checks the development of the sensitivity, and of the sensitivity that of the intellect"; but it is as irrelevant as it is true, for the exclusive cultivation of any one power checks the development of any other. Exercise the imagination alone and the judgment will suffer; yet both imagination and judgment are cognitive powers. Indulge any one feeling alone and it must be at the expense of others. And the reason is plain. It is not that there is any essential, still less any occult or mysterious, opposition between one faculty and another, one capacity and another, but simply that no faculty can be strengthened, no capacity elicited, save by acts or indulgences peculiar to itself, and that if one faculty be exclusively exercised or one capacity exclusively excited, others are, *ipso facto*, neglected and disused, the consequence of which is weakness and deadness. Thus we can no more accept this than the other distinctions.

The result, then, at which we arrive is that all the distinctions laid down by Fleming fail to serve their purpose. There is not one of them which does not involve errors of fact or irrelevances; not one of them which does not tend to fill the mind with a false persuasion of knowledge. But are there any other, any better distinctions current among psychologists? Believing that there are not, I draw the practical inference that a new and searching investigation into the nature of the relationship of the intellect to the sensitivity, of thought understood in its widest or generic sense to feeling understood in its widest or generic sense, is greatly needed. It is chiefly for the sake of suggesting such an investigation that this Note has been written.

R. FLINT.

*Kant's Analytic and Synthetic Judgments, and his question, How synthetic à priori judgments are possible.** The distinction between analytic and synthetic judgments will fill an important chapter in the history of modern philosophy, for it is on this distinction that Kant bases his whole exposition of the *Critic of Pure Reason*. Kant claims the merit of its discovery and of bringing it into connection with the old distinction between *à priori* and *à posteriori* cognition; whereby arose the fruitful question, How synthetic *à priori* judgments are possible, to which question the whole *Critic* was the answer.

The distinction was one admirably adapted for Kant's purpose, namely, to bring into a clear light the nature of the problem which he was setting himself to solve. It is as if he said—I mean to inquire not merely into the logical laws of thought, but into the validity of positive experience, the reality of objects, the reality of causation. How do we get our notion of, and consequent belief in, real objects, independent of ourselves? I find myself, and see others, believing in such real objects. How do we come by the belief, and is there any justification for it? If so, what is it? I do not mean merely the absence of contradiction in the objects in question. Of course that is a negative condition of their reality. They must obey the logical laws of thought, must be capable of standing in logical connection under the Postulates of Logic, must not be self-contradictory when resolved into analytical judgments. But I ask (supposing this negative condition fulfilled) what ground there is in reason for our belief in their reality, what positive condition do they or can they fulfil, in order that our belief in their reality should be a true belief? How do we arrive at the notion of a real object at all? Of an object not only not self-contradictory but positively existing, with mutual interdependence of its parts, subsisting themselves and sustaining each other? How put together out of impressions of sense, which are all we have to begin with? How do we put this to that in the first instance? When we have once got objects put together, we can go on putting them together; we have then synthetic judgments of real objects. But my question is about the first instance of this

* *Krit der reinen Vernunft*, 2nd. ed. Einleit. §§ iv.-vi. and pp. 454-62, 471-76, in Vol. I. *Werke* (Rosenkranz u. Schubert).

process. How are synthetic *à priori* judgments possible? And does this possibility, this condition, the way in which they arise, when discovered, prove that our notion of the reality of the objects put together in the first instance is a true notion?

Such was the problem and such the mode of stating and preparing it for solution which Kant adopted. It has the great merit of bringing the nature of the problem into the clearest light; and when we consider that this problem is the great problem of philosophy, that unless it is plainly and distinctly faced all philosophical speculation is no better than an *ignoratio elenchi*, a false issue substituted for the true one, the merit of Kant's statement will be admitted to be immense. At the same time there may be other ways of exhibiting the problem and preparing its solution, ways which may be free from a certain inconvenience which attends upon Kant's way.

In the first place, to what branch of knowledge does the distinction belong; is it a distinction in logic or in philosophy? Certainly not in formal logic; for it depends upon the matter of the judgments. If the predicate is contained in the subject, so as to be deducible from it without other aid than the principle of Contradiction, the judgment is analytic; if not so contained, synthetic. "All bodies are extended" is Kant's instance of analytic, "All bodies are heavy" his instance of synthetic judgments. It is, then, a distinction between concrete judgments; and, so long as we look no farther than to the distinction itself, there is no criterion of what judgments are analytic and what are synthetic. "All bodies are heavy" might to an unlearned person seem an analytic judgment, if his notion of body happened to include weight as one of its attributes. The applicability of the distinction fluctuates with the circumstances of speaker and hearer.

It is only when we come to connect this distinction with that other between *à priori* and *à posteriori* knowledge, that anything like a criterion for arranging judgments under the distinction discloses itself. 'Necessity' according to Kant is the evidence of an *à priori* origin. Those judgments accordingly which give new knowledge, not already contained in the subject of the proposition, and which also bear the mark of necessity, are synthetic *à priori* judgments; that is, are those judgments in which centres the whole interest of Kant's system. It is, then, only in judgments which are *à priori* as well as synthetic that we meet with any criterion for ranging this or that judgment under this or that member of the distinction. And this criterion itself, necessity, is so uncertain, that to distinguish true from apparent cases of it may be said, from one point of view, to be a chief purpose of the whole Kantian system.

Admirable therefore as the distinction is for the purpose of exposition, it must not be supposed or allowed to settle anything in the solution of the problem which it is employed to state. It may be a very valuable distinction for the purpose of directing inquiry, and yet turn out to be a distinction which has no place in the system of philosophy established by means of it, just as a scaffolding has no

place in the completed building. Before it can legitimately lead to or suggest one solution rather than another, it must show its right to an independent position in the system; as for instance the Table of Logical Judgments does, before it is used as the clue to the Categories. If it does not show similar credentials, we must be on our guard against building any part of our conclusion on it.

Let us look, then, at the merits of the distinction in itself. What is its value as a distinction between concrete judgments? This must be admitted, I think, to be only of a practical kind, as an aid to careful thinking. It is always an useful reminder—What precisely do I mean by A; and what precisely do I mean to add to it by saying A is B? It is nothing more nor less than a distinction between old and new knowledge, knowledge being supposed to be embodied in judgments or thrown into that form. Where the predicate contains no more than an explication of the subject, the judgment gives back old knowledge only; where it adds something to the subject, it gives new knowledge. It is no doubt practically valuable to distinguish these cases. But as part of a theory of logic or philosophy the distinction has no value at all. Theoretical distinctions between judgments must be drawn not from the matter but from the form. Looked at from the formal point of view every judgment is both analytic and synthetic at once. Analytic, because it presents our knowledge in a discrete shape, as subject, copula and predicate. Synthetic, because it is a process, with beginning, middle and end, by which this is done.

The terms *analytic* and *synthetic* serve properly to classify not judgments but methods. It is methods, not judgments, that are either analytic and not synthetic, or else synthetic and not analytic. Every judgment, *i.e.*, every single act which goes to compose a method, is properly speaking analytic and synthetic at once. It is only in the gross, in a series of those acts, that you see whether you are analysing an already given whole, or building up a fresh one.

Kant, then, drew a distinction which was correct but arbitrary and misnamed it, whereby it appeared better than it was, appeared to be a distinction of nature and analysis, when it was only one of history and genesis. The names apply to a true and essential distinction between methods; the distinction which Kant drew between judgments was in itself truly drawn, but it was arbitrary and not essential as a distinction between them. To apply the names *analytic* and *synthetic* to these judgments was to give that distinction the air of a theoretical and essential one; it made the two sorts of judgments look like classes different *in kind*, and formed on different principles. It thus favoured the belief in the faculty of thought being an independent and originaive source of cognition. For methods are mental processes, and the names *analytic* and *synthetic*, being properly applicable to designate essentially different methods, suggest naturally an essential difference in the processes of judgment to which they are applied, suggest that the judgments called synthetic depend on different mental principles from those called analytic. The names

analytic and *synthetic* as applied to judgments point to an essential difference in the constitution of the mind, while the judgments to which they are applied, being plainly distinguishable, appear to give that suggestion the warrant of facts.

Of course I am not saying that the distinction between analytic and synthetic judgments was Kant's only ground of belief in a synthetic faculty of mind. All I say is, that it favoured and suggested that belief. Kant's real grounds were his belief in the necessity of certain scientific cognitions as an established fact, combined with his belief that this necessity could not be due to the order in which sensations occur to us in time and space. And this necessity is with him the evidence of an *à priori* origin. Besides it must be remembered that the *Critic of Pure Reason* was a transformation-scene in the history of Animism. Notwithstanding the disproof it contains of one form of it, in the Paralogisms of Pure Reason, still the notion of mind as an immaterial agent, though of utterly unknown nature in itself, underlies the whole *Critic*. And it is difficult to see how an immaterial agent can be other than synthetic in its acts of judgment. And if synthetic, then also synthetic *à priori*. For the acts of judgment would not be the mind's own acts, if there was not some element in the resulting judgment contributed by the mind; some constant element in all, some necessary form, some *à priori* knowledge.

The first answer to Kant's question, How synthetic *à priori* judgments are possible, is, that it is by means of the pure 'Principles' of the faculty of Judgment, other than the Principle of Contradiction. The higher cognitive faculty consists, according to Kant, of three faculties corresponding to the three operations of the logical textbooks,—Understanding which forms concepts, Judgment which combines them into propositions, and Reason which frames syllogisms from propositions. Each faculty works by pure, transcendental, forms, the cognitions arising from which are *à priori* cognitions. Judgment also is, as we have seen, a double faculty, analytic and synthetic; and the first answer to Kant's question refers to its synthetic branch.

But Kant's problem is by no means solved when this first answer has been given. Neither his synthetic nor his analytic judgments can be the first step of all in cognition. Both kinds presuppose the subject of their judgments already formed and partly known. And the further question arises, How are these subjects of judgments formed?

At this point again is seen the influence exercised by mistaking the distinction between old and new knowledge for a distinction between mental processes different in kind. All knowledge must have been new once, new before it was old; though the question is not now of judgments, but of a more elementary faculty of cognition. What is the process by which new knowledge is formed? For since the new precedes the old, that also will be the process by which it was originally acquired. The possible alternatives are given by

identifying new with synthetic, old with analytic cognition. These being the alternatives, the question is already answered: synthetic processes precede analytic. Pure transcendental forms of the Understanding, the Categories, enable us to frame concepts which are afterwards (through the medium of the Schematism of the Judgment) combined or explicated by the synthetic or analytic judgment-faculty. The Understanding is the faculty of rules, the Judgment that of subsuming cases under rules.

The conclusion, then, that I come to is, that the distinction between old and new knowledge, which is all that is really contained in Kant's distinction between analytic and synthetic judgments, and which, so estimated, has a high expository value, is made to carry a fictitious one by being supposed to be a distinction between essentially different kinds of judgments. Old and new cognitions are the same in point of kind; and all, whether they are concepts or whether they are judgments, have a prior condition on which they are based, namely, the chain of perceptions which is continually passing through consciousness. In that chain, percepts are originally combined, come to us in a certain combination originally. Concept-forming and Judgment are merely the re-combination of the parts of this chain, breaking up the first combinations and forming the parts afresh into new ones. There is no reason to suppose any synthetic forms of thought requisite for effecting this. What Kant called the principle of Contradiction, better perhaps the Postulates of Logic, is quite sufficient. And if there is any 'necessity' in the judgments or in the combinations effected by them, other than this, it must be sought in the percepts which are their material and their condition; for it is only a metaphysical theory of this nature, and not one which maintains pure synthetic forms of thought, that can be brought into harmony with the facts of psychology.

SHADWORTH H. HODGSON.

Mr. Sidgwick on 'Ethical Studies'.—In the last number of *MIND*, Mr. Sidgwick did me the honour to review my *Ethical Studies*. His remarks were on the whole welcome to me, for they showed clearly the necessity there was, and is, for some work of the kind. I am not surprised that my reviewer did not *see* that necessity: that he *felt* it I think his article shows. "Really penetrating criticism, especially in ethics, requires a patient effort of intellectual sympathy," and I am sorry that such an effort should be made in vain. But that in this instance it has been so I should like to be allowed to show. I am prepared to go through the article point by point, but cannot ask from the readers of *MIND* so much space for matters partly personal. Indeed if the reviewer had confined himself to remarks of a personal or generally depreciatory nature, I would not have trespassed on their forbearance at all. As it is I must ask leave to correct some misunderstandings which are calculated to prejudice my views by representing them to be other than they are.

And (1) I must impress on the reader that I disclaimed the attempt

to solve the problem of individuality in general; and in particular that of the origin of the Self in time, and the beginning of volition. But so far as I have said anything, I will endeavour to show that it is not incoherent, as soon as objections against it are distinctly formulated. I can not do so before. However, I may say that I have no quarrel with Determinism if only that view will leave off regarding the Self as a collection, and volitions as 'resultants' or compositions of forces, and will either reform or cease to apply its category of cause and effect. The problem, as Mr. Sidgwick states it, on p. 46 of his *Methods of Ethics*, I consider to involve a false alternative.

(2) The fact that when I speak of self-realisation "we naturally think of the realisation or development into act of each one of the potentialities constituting the definite formed character of each individual" is not surprising, until we have learnt that there are other views than those which appear in the *Methods of Ethics* (p. 72 foll.). And this we very soon do if we proceed. I have written at some length on the good and bad selves (Essay VII.); and on p. 146, I have repudiated distinctly Mr. Sidgwick's understanding of the term. I thought that I had left no doubt that characters might be partly bad, and that this was *not* what I meant by self-realisation, as = end.

(3) "We may at least say that a term which equally denotes the fulfilment of any of my desires by some one else and my own accomplishment of my duty, will hardly avail us much in a definition of the Highest Good." Perhaps. But I emphatically repudiate the doctrine that the mere bringing about by some one else of anything desired by me is my self-realisation. If the reviewer wishes the reader and myself to believe that I put this forward, he owes us a reference. If it be meant as a *deduction* from my premisses, he owes us an argument. He has given us neither; and as I think, nothing but a sheer misunderstanding.

(4) Mr. Sidgwick must be aware that I have endeavoured to define self-realisation, as = end. He proceeds to remark, "the question then is whether we gain anything by calling the object of our search 'the true whole which is to realise the true self'". I think we do; but then I have not left the matter here as my reviewer seems to indicate. That point of view is reached on p. 67, and the whole remainder of the discussion down to p. 74 is quietly ignored by him. I call particular attention to this.

The passage on Hedonism which follows I will take hereafter.

(5) I do not know whether in what is said about Kant there is an objection to my views, nor, if so, what that is; but when the reviewer says of me, "he accepts a merely relative universality as a sufficient criterion of goodness," I must remark that this is what I do *not* say. I say relative *and* absolute, (p. 174); and this appears even from my reviewer's next page.

(6) "Mr. Bradley, I think, has not clearly distinguished this view from his own; and the effectiveness of his argument against Individualism depends chiefly on the non-distinction." The view is "the old doctrine . . . that the individual man is essentially a social

being". But (a) if my view is partly the same as another, what is that against it? (b) If Mr. Sidgwick will point out confusion, I will admit it or answer it. I cannot do either until he does. (c) At any rate, "that the individual man is essentially a social being" is my view, and is *not* my reviewer's. If it be "a vague and barren ethical commonplace," yet in his book he must be taken to deny it, for he finds the end, and, I suppose, the essence of man by examining a supposed "single sentient conscious being" (p. 374).

(7) "He allows . . . even that 'open and direct outrage on the standing moral institutions which make society and human life what it is,' may be 'justified on the plea of overpowering moral necessity'." Here I must earnestly beg the reader to consult the context in my book (pp. 204-5). I cannot ask for space to quote it. The question I was discussing was the extent to which *in theory* we must hold that collisions may proceed (*cf.* p. 142). On p. 143 I distinctly denied that 'moral theory' is 'meant to influence practice' (*cf.* p. 205 foot-note). And I do think this ought not to have been ignored.

(8) My reviewer continues—"But here he plainly comes into conflict with 'unsophisticated common sense': and surely, if that authority be thus found *falsus in uno*, it must be at least *fallibilis in omnibus*: and thus we have still to seek for some criterion of the validity of its dictates". First, I must ask for a reference for 'unsophisticated common sense'. It is given as a quotation from me, but I do not recognise it. Next, I have maintained that I do *not* really come into collision with common morality, but, when understood, am at one with it (p. 204, *cf.* 142-3). And my reasoned exposition, ignored by the reviewer, may stand I hope against his "plainly". Thirdly, he argues, What is *falsus in uno* is *fallibilis in omnibus*. The falseness in this one thing I deny. Next, if I admitted it, I should like to see the steps by which the conclusion follows. Next, I have never hinted that the moral consciousness is *not* fallible in particulars. Mr. Sidgwick really should give references for what he attributes to me. Next, I deny that it is fallible in all points. Lastly, even if it were false throughout, I say we have *not* "to seek for some criterion of the validity of its dictates"; for none is possible.

This is all I think it necessary to say in answer to that which my reviewer has urged against the doctrine I have put forward. The rest which I have not noticed, I must not be taken to admit. And now, seeing that a large part of my book was directed against Hedonism in general, and one or two pages even against Mr. Sidgwick in particular, I naturally hoped for some discussion of the matter. This is all I can find. "The notion of Maximum Pleasure is certainly sufficient for systematising conduct, as it gives us a universally applicable standard for selecting and regulating our activities. But it does not give us an end which can ever be realised as a whole, in Mr. Bradley's sense, that is, all at once: for obviously there is and can be no moment at which a 'greatest possible sum of pleasures' can be enjoyed."

First, as was said above, the reviewer ignores my interpretation of self-realisation. Next, he suggests that my argument against Hedonism is that pleasures cannot be enjoyed all at once. True, that is an argument; but is it possible that Mr. Sidgwick can really believe that in other respects Maximum Pleasure answers to my conception of the end? This is so wholly at variance with the doctrine I hold that I confess I was not prepared for it. Thirdly, that the notion of Maximum Pleasure can systematise conduct and give a standard, is a proposition I have formally contested. Mr. Sidgwick not only gives me an assertion for an answer, but by the way he introduces the assertion suggests to the reader that I believe it myself.

I can find no other defence of his opinions but the (unsupported) charge against me that I use rhetoric for argument, and that my apprehension of the views which I assail "is always rather superficial and sometimes even unintelligent". Those views I think should be securely founded, if they are to bear being defended in this way.

F. H. BRADLEY.

[Mr. Bradley seems to be under a strange impression that, while professing to write a critical notice of his views on ethics, I have been or ought to have been—defending my own. I entertain quite a different notion of a reviewer's "station and duties". In criticising his book (or any other) I put out of sight my own doctrines, in so far as I am conscious of them as peculiar to myself: and pass my judgments from a point of view which I expect my readers generally to share with me. Hence the references in his reply to my opinions would be quite irrelevant, even if he understood those opinions somewhat better than he does. I passed lightly over his attack on Hedonism in Essay III. for the simple reason—which I gave—that I thought it less interesting and important than other parts of his work. Much of it, as he must be perfectly aware, either has no bearing on Hedonism as I conceive it, or emphasises defects which I have myself pointed out: the rest consists chiefly of familiar anti-hedonistic commonplaces: the freshest argument I could find was one with which I had made acquaintance some years ago in Mr. Green's Introduction to Hume. This, as stated by Mr. Green, I have taken occasion to answer in the course of an article in the present number of this journal. The attack on my book appended to Essay III., though not uninteresting to myself, is far too full of misunderstandings to be profitable for discussion. It is criticism of the kind that invites explanation rather than defence: such explanation I proposed to give in its proper place—which was certainly not my notice of Mr. Bradley.

On the special points which he raises, the very briefest reply will suffice.

(1) (2) (3) He scarcely attempts to answer my charge of 'want of clear coherence' in his exposition of 'Self'. He does not deny that the 'self' presented in Essay I. is dropped without explanation when we pass to Essay II., and other accounts are given of the same notion. Among them is the statement that "all we can desire is self"; from which I drew the immediate inference that the fulfilment of any desire is a kind of self-realisation: if he did not intend this inference, pp. 61, 62 are confusing and somewhat irrelevant.

(4) The discussion on 'finite' and 'infinite' (pp. 68-73) is a part of the metaphysics of which, in general terms, I notified my omission. I

thought, and think still, that it was comparatively unimportant to the ethical discussion. A critical notice does not profess to be a table of contents.

(5) He misunderstands my 'relative universality'. I say that the social organism, of which the individual in Essay V. is explained to be essentially a part, is a *relative* and not an *absolute* whole. That is, it is not the universe: and we have no reason to identify its will—granting this to be real and cognisable—with the universal or Divine Will to which our wills should conform.

(6) I did not absurdly complain that he combined in his *positive* doctrine the common view of society as a natural organism with his peculiar view of this organism as possessing a reasonable will: I criticised him for not distinguishing them in his polemic against Individualism. The result of the non-distinction is that much of this polemical argument—as far as I can trace it through its folds of rhetoric—is directed against an individualism which will find no defenders: the individualism, namely, to which the 'Social Compact,' belongs, and to which Utilitarianism long since gave the *coup de grâce*.

(7) (8) I still maintain that the non-theoretical unreflective person who is exalted in Essay V. as furnishing the moral standard will be considerably startled to find his encomiast justifying, with whatever qualifications, "open and direct outrage on the standing moral institutions which make society and human life what it is". He will regard Mr. Bradley as almost a "thinker," and at least "on the threshold of immorality". And I doubt whether he will be quite consoled by learning that this justification is not "meant to influence practice": though I admit that the consolation is well adapted to the average philosophical capacity of the non-theoretical person.

But I need not press this point: because Mr. Bradley, as I understand, admits the possibility of a conflict between common sense and his private moral consciousness; and is prepared, in case of such conflict, to rely entirely on his own particular moral intuition, allowing no appeal to any express principle or external standard. If this be so, his apparent reference to an external standard in Essay V. is found (as I said) to be devoid of precise meaning or scientific value.

To sum up, then, I have nothing to retract or qualify on any of the points raised by Mr. Bradley—except a pair of inverted commas which were accidentally attached to a phrase of my own. But I should prefer to part from him in a friendly manner; and therefore I am glad to find something to concede to him in the phrase in which I characterised his style as over-rhetorical. I still dislike the quality of his rhetoric, whether it be satirical, pathetic or declamatory: and I think it is sometimes introduced, at important points, so as to interfere with the closeness of his reasoning. But I find that the sentence in which I combined these two judgments was too strongly worded: and am glad to substitute for it the milder phrases just given.

HENRY SIDGWICK.]

Mr. Hodgson on 'Cogito ergo sum'.—Assuming that Descartes' first principle really means what Mr. Hodgson (MIND IV.) says it does—that my being and my consciousness are one, that my being is my consciousness and my consciousness my being—what are we to make of a sentence like the following?—"If the true sense of '*Cogito ergo sum*' is what I contend, *My existence means my consciousness*, we can go on to generalise this in application to other things: their existence

means the consciousness which I or others have of them; *esse* means *percipi*." Is there not something very far wrong here? When I say, *I exist*, I mean, *I am conscious*; but Mr. Hodgson declares that this statement generalised runs so—The existence of other things means, not *their* consciousness, but *my consciousness of them*. Now, it appears to me that this is a generalisation in which the essential element of the particular has been left out of the general, that there is, in fact, absolutely nothing in common between the particular proposition started with and the generalised result. If the fundamental truth of philosophy were, My existence arises *in* my consciousness, existence and consciousness might be regarded as possibly different; in any case, the *nature* of existence would be an open question. But if the ultimate fact is, My existence arises *as* my consciousness, then existence and consciousness are indissolubly one, and conceivable only as different names for the same thing. When, therefore, I generalise the conception of *my* existence, and apply it to that of other things, the generalisation ought to be—The existence of other things means *their* consciousness. This seems so obviously the only fair logical extension of Descartes' deliverance as interpreted by Mr. Hodgson, that I am half disposed to believe that I am somehow misunderstanding the very plain-looking words of the sentence just quoted. If all that I know of existence at first hand—that is, in my own case—is, that it is always a mode of consciousness, then, when I extend this unvarying experience to other existences, real or conceived, is it lawful for me to strike out of the idea of existence as thus extended its inseparable other-half, consciousness? Surely this would be no extension of my own individual experience at all—no generalisation in any proper sense of the word. In my own case, existence and consciousness stand or fall together; but the existence of Peter and James and John, and stocks and stones, is secure enough, it appears, *if somebody else is conscious of them*. The logic here looks alarming, but Mr. Hodgson is responsible for it, if I have not grossly misunderstood his language.

The existence of other things being supposed, it seems clear that, if we are entitled to extend to them that conception which is given in every one of our own conscious acts, we *must* attribute to all conceived existences *some* form of consciousness—a generalised form, of course, but still a consciousness. Otherwise, there will have been no true logical extension of Descartes' primary conception. If *esse* means *percipere* in the particular, it cannot be transformed into *percipi* in the general. It is absurd to represent the passive voice as a generalised form of the active.

Mr. Hodgson remarks that Descartes' deliverance "does not tell us what existence *in general* is; that would disqualify it at once for a *beginning* of philosophy; it speaks only of a particular case, the case of *ourselves*". But existence in general must be the same *in kind* as existence in particular, else generalisation would signify metamorphosis; and if consciousness is the very essence of existence in each particular case, it must be conceived as present in all cases. And there is the more need for extreme watchfulness as to the use made of this root-

proposition, because many things just now seem pointing to the conclusion, that on Descartes' '*Cogito ergo sum*,' rightly understood, the philosophy of the future can find its only firm footing; that his first principle, boldly carried to its farthest logical issues, can be shown to possess that necessity and universality without which no system of thought can be other than an unenduring cloud-world of more or less consistency. If consciousness were clearly seen to be co-extensive with existence (actual and conceivable), that hitherto fruitless and painful search for the *Ding-an-sich* would cease—for the "thing in itself" would then have been found; the Kantian dualism, with all its perplexing inconsistencies, would fall to pieces; and the incorrigible Hegelian even would acknowledge that all the unquestionable truth in his master's system had been embraced in the one dictum, Existence is Consciousness. Whether or not Descartes himself saw to the end of the road along which his principle points, this is not the place to inquire; the intention here is simply to note the fact that Mr. Hodgson, at all events, would appear to have missed the path altogether.

As against Mr. Arnold's reading of the famous '*Cogito ergo sum*,' the passage quoted by Mr. Hodgson seems decisive, though it is more than questionable whether it will appear so to the author of *God and the Bible*. Mr. Arnold's own contributions to philosophy having hitherto, most of them, taken the form of contemptuous remarks upon philosophers, expressed in the choicest of English, and with all the graces which culture can bestow, he is not likely to be greatly moved by this note or that of Mr. Hodgson. But all those who make philosophy a serious study will be disposed to admit that the significance of the Cartesian First Principle is, even in these advanced times, worthy of the strongest possible emphasis.

ALEXANDER MAIN.

[Mr. Main's note is opportuneness itself. I was quite aware that many might require to have the grounds of my generalisation of the '*cogito*' fully drawn out before accepting it, but I was withheld from saying more by the fear of travelling out of the record. Now, however, Mr. Main comes to my aid, and that by so clear and forcible a statement of the opposite alternative as to save me from all need of restating it, as I must have done if I had explained the whole case myself.

Assuming, then, that *my existence means my consciousness* expresses the true sense of the '*cogito*,' I argue that Mr. Main's generalisation of that statement, *viz.*, that the existence of other things means their consciousness, and that *esse* means *percipere*, is inconsistent with its true sense. In *my existence means my consciousness*, *my consciousness* may *primâ facie* be taken to signify one of three things, either (1) myself being conscious, or having my states of consciousness; or (2) my states of consciousness as coming from existing things; or (3) my states of consciousness alone. (The word *my*, in all three cases, is merely a word of designation, to make it clear to the reader that I am not passing beyond the limits of the subject, my consciousness). Now the two first of these meanings are excluded from being the true meaning, because each of them assumes existence as known, the existence of myself in the first case, of things in the second, and thus nullifies the statement *my existence means my consciousness*, and disqualifies it as an explanation of

my existence. It is no explanation of my existence to say that it means myself having consciousness, for that assumes that I already know myself as having something, that is, as existing.

It is this meaning of my consciousness which is involved in Mr. Main's generalisation. It would make Descartes' *'cogito'* say, *I exist because I exist thinking*; it would simply unsay the *'cogito'*. The only admissible sense of the *'cogito'* is the one in which my consciousness means my states of consciousness alone, states which become objects to me in the *'cogito'* moment, which is the moment of self-consciousness or reflection. They and they alone, in the first instance, are the explanation of my existence; my *esse* is not my *percipere* but my *percipi*.

Adopting this, the sole admissible, meaning of my existence means my consciousness, I then generalise it by dropping the particular circumstance that it is mine. The *esse* of anything means that it is an object in some consciousness, its own or other. As Mr. Main truly remarks, "existence in general must be the same in kind as existence in particular".

I cordially concur also in the necessity for extreme watchfulness in the use made of this "root-proposition"; and also in the belief that it offers the only firm footing for philosophy. But I cannot agree that Mr. Main's generalisation of it necessarily precludes a *Ding-an-sich*. On the contrary, the interpretation on which it rests apparently introduces a *Ding-an-sich* as Subject; for by that interpretation a percipient Subject is assumed without the explanation of a predicate. But by my interpretation a predicate is given to the supposed Subject.

Some other consequences too of Mr. Main's interpretation, if the *'cogito'* is also made the basis of philosophy, are familiar to us. It is the conception which is at the root not of Fichte, Schelling and Hegel only, but of all the forms which are or may be included in the now fashionable philosophy of Monism, the latest importation from chimeraland. The last outcome of philosophy would be evidently necessary from the very first step in it, on Mr. Main's interpretation of Descartes. If to be endowed with consciousness is a condition of existing, it follows at once that whatever exists is, or has been endowed with consciousness, —for instance, the Universe. Philosophy is not so royal a road as this syllogism would imply.

Another side of the question remains to be considered. No generalisation of the *'cogito'* can be true which contradicts or unsays the *'cogito'*. The true sense of the *'cogito'*, when once established, is a test to which we must bring any proposed generalisation. The consequence in the *'cogito'*, its *ergo*, may *primâ facie* be taken as one of three different kinds, namely, as introducing and assigning either (1) the condition of existence of my existence; as, my existence results from my consciousness; or (2) the condition of my knowing that I exist; as, the fact that I exist is shown by my being conscious; or (3) the condition of my knowing what my existence is; as, my existence means my consciousness. There are three possible alternatives, because there are three ultimate sorts of conditions, *existendi*, *cognoscendi*, and *essendi*. The last of the three alternatives has been shown to be the true one. I argue, therefore, that any proposed generalisation of the *'cogito'* which either assigned a condition of existence for existence at large, or assigned a condition of knowing the fact of existence at large, would not be true as a generalisation of the *'cogito'*.

But Mr. Main, in his first sentence, puts my interpretation of the *'cogito'* thus: "that my being and my consciousness are one, that my being is my consciousness and my consciousness my being". The word

is, when standing as copula, gives no indication which kind of condition is intended by the proposition. And therefore I was careful to interpret the *is* in the '*cogito*' by the word *means*, having shown the '*cogito*' to express only *what* existence was, and not how it arose nor how it was inferred. Mr. Main, in recurring to the unanalysed use of *is*, really unsays Descartes' proposition.

SHADWORTH H. HODGSON.]

XII.—NEW BOOKS.

History of English Thought in the Eighteenth Century. By LESLIE STEPHEN. 2 vols. London: Smith, Elder & Co. Pp. 466, 469.

This very important work will be reviewed at length in a future number. It is first of all, as the preface tells, a history of the Deistical movement; but for this it "seemed necessary to describe the general theological tendencies of the time, and, in order to set forth intelligibly the ideas which shaped those tendencies, it seemed desirable, again, to trace their origin in the philosophy of the time and to show their application in other departments of speculation". The author therefore begins with an account of the contemporary Philosophy, and seeks besides "to indicate the application of the principles accepted in philosophy and theology to moral and political questions, and their reflection on the imaginative literature of the time"; though in dealing with political theories he tries to keep as far as possible from the province of political or social history.

A Treatise on the Moral Ideals. By the late JOHN GROTE, B.D.
Edited by Joseph Bickersteth Mayor, M.A. Cambridge:
Deighton, Bell and Co. 1876. Pp. 519.

Professor Mayor, continuing his work as editor, here prints the constructive treatise on Ethics which the late John Grote turned to write on resigning his original intention of publishing a controversial answer to Mill's *Utilitarianism*. The controversial treatise, which had been partly printed when laid aside, after all saw the light first, being published six years ago by Prof. Mayor, in the exercise of his editorial discretion, under the title of *An Examination of the Utilitarian Philosophy*. The present work will be reviewed in the next number of MIND, and all reference to its contents may therefore be deferred. As in the case of the former work, the editor's duties have been very onerous. He now proceeds to prepare for the press the second part of the *Exploratio Philosophica*, of which Part I. appeared in 1865, the year before Professor Grote died.

A Philological Introduction to Greek and Latin, translated from the German of FERDINAND BAUR by C. Kegan Paul and E. D. Stone. London: King & Co. 1876. Pp. 153.

This little work, however technical, calls for notice in MIND by reason of the remarkably clear psychological conceptions underlying

the author's treatment of his special subject. The exposition falls into three parts, from the division of Philology or the science of Language (as the phonetic representation of Thought) into Glottology, dealing with Vowels and Consonants as the *matter* of language (1), and Grammar or the science of linguistic *form* in the two phases of (2) Root and Stem formation, and (3) Word formation or Inflection. How the Root arises originally as the expression of a general idea and passes into the fully developed Word through the Stem, is very accurately conceived in point of psychology, and the philosophical student may follow even the technical details of the book for illustration of the principles which he will find (for his purposes) only too briefly expounded.

An Introduction to the Principles of Morals and Legislation. By JEREMY BENTHAM. Oxford: at the Clarendon Press. 1876. Pp. 336.

A timely and handy reprint, for the use of students, of this classical work (first published in 1789), according to the 'New Edition, corrected by the Author,' which appeared in 1823.

Behind the Veil. An outline of Bible Metaphysics compared with ancient and modern thought. By THOMAS GRIFFITH, A.M., Prebendary of St. Paul's. London: Longmans, Green and Co. 1876. Pp. 230.

The work is divided into four parts: I. Invisible Realities. II. The Realities in Nature. III. The Reality in Man. IV. The Supreme Reality. The present age demands *facts*. But we cannot rest there. Facts are phenomena in the human mind. But phenomena suggest the questions—Phenomenal of what? Phenomenal to what? Hence the faiths of mankind, the reaching beyond the known. Three Realities must in short, be believed, although not beheld—a Reality beneath nature, a Reality at the base of all mental phenomena, and a Reality underlying the universe or nature and mental phenomena. With regard to the first all philosophy testifies that things are not what they seem. Nature is summed up as matter and force, and as matter is only known to us as force, our system of the universe is an orderly arrangement of forces; for which we are entitled to read "Realities which put forth force," even as the energy exerted by ourselves wells up from an unfathomable depth below. For secondly, Man is not all that he seems. There is an unrevealed "inward" man or true self, the recognition of which is not only spontaneous with the common mind, but emerges through the contradictions of thinkers who would deny it. The Ego cannot be eliminated from our psychological statements, as at once a Recipient of impressions, a Percipient of thoughts, an Incipient of actions distinct from impressions, thoughts, and actions. Lastly, the hidden realities in nature and in man are obviously not unconditioned realities. They are interdependent and limited. They, too, must have a ground, an Unconditioned Reality of realities. The Being, Character, and Proce-

ture of God are the titles of the closing chapters, occupying a large portion of the volume. The work is enriched with references, indicating a catholic range of reading.

Studies in Ancient History, comprising a Reprint of 'Primitive Marriage'. By JOHN FERGUSON M'LENNAN, M.A., LL.D. London: B. Quaritch, 1876.

Mr. M'Lennan here reprints his well-known and much sought-for essay on Primitive Marriage (1865) in its original form, rather than keep it longer out of print for the revision he has hitherto been unable to make and could now not make in a short time. By appending, however, some essays on related subjects, his publication now assumes the wider scope indicated by the new title. The first of the appended essays, 'Kinship in Ancient Greece,' is itself a reprint, being the author's reply in 1866 to a challenge from Mr. Gladstone to show proof that kinship through mothers ever existed among the Greeks. The new essays are four in number: (1) 'The Classificatory System of Relationship,' against Mr. Morgan; (2) 'Bachofen's *Das Mutterrecht*'—a work that anticipated by four years the author's discovery of the fact of female kinship, though on very different grounds from his; (3) 'Communal Marriage'—against Sir J. Lubbock; (4) 'Divisions of the Ancient Irish Family'—against Sir H. Maine.

Winds of Doctrine: being an Examination of the modern theories of Automatism and Evolution. By CHARLES ELAM, M.D. London: Smith, Elder & Co. 1876. Pp. 163.

Dr. Elam here reprints some essays on Automatism and Evolution which have recently appeared in a serial form. They were written for the most part in 1874 after the meeting of the British Association at Belfast, where Professors Tyndall and Huxley held forth in the way known to all men. The somewhat 'question-begging' title now prefixed to the essays indicates their drift: the doctrine of Automatism depends on the doctrine of Evolution, and the doctrine of Evolution is a sheer figment of the intellect, unsupported by the least direct evidence and in its outcome flatly contradicting all the deepest convictions, intellectual, moral and religious, of human nature. Like wind, it will pass.

Philosophische Consequenzen der Lamarck-Darwinschen Entwicklungstheorie. Ein Versuch von Dr. GEORG VON GIZYCKI. Leipzig u. Heidelberg: C. F. Winter. 1876. Pp. 97.

The author (who professes himself to be a disciple of Zeller in philosophy) takes exactly the opposite view of Evolution from Dr. Elam, and holds that the doctrine is not only verified as much as a doctrine of such comprehensive scope can be, but has full possession of the scientific field: "this or nothing". At the same time he is no less concerned than Dr. Elam for philosophic truth and for the

practical interests of morality and religion, and his little book is written to show that the theory of Evolution, when truly conceived, does not turn, as commonly supposed, in *majorem materialismi et atheismi gloriam*. The philosophical consequences of the theory are drawn out under the four heads of Psychology, Epistemology, Morals, Religion.

Die Philosophie Shaftesbury's, dargestellt von Dr. GEORG VON GIZYCKI. Leipzig u. Heidelberg: C. F. Winter. 1876. Pp. 200.

The author is of opinion that no extant ethical doctrine comes so near as Shaftesbury's to meeting the requirement now imposed upon philosophy, namely, that it conform to the spirit of positive scientific inquiry. He is therefore concerned to set it forth at the present time, more especially in opposition to the "contranatural" ethical system of Kant. Shaftesbury's works were translated into German in the course of the 18th century, and made no small impression on Herder and others; but, according to the author, their philosophical importance has never been sufficiently recognised, while by Schlosser their true character was grossly traduced. Neither in his own country has Shaftesbury received justice, his "idealistic" philosophy appearing like an exotic plant upon English soil. The author is wholly at one with Shaftesbury in conceiving ethics as having for its subject Virtue, not Duty, and he holds that an ethical doctrine should in particular include (1) a theory of the springs of human action, (2) a theory of virtue or moral excellence, and (3) a theory of moral progression and decline. Shaftesbury's doctrine lends itself naturally to exposition under these three heads, and the work ends with a chapter on his religious philosophy.

Kant's Analogien der Erfahrung. Von ERNST LAAS. Berlin, Weidmannsche Buchhandlung, 1876. Pp. 363.

The Analogies of Experience seem to the author the central point of Kant's philosophy in its theoretical aspect, and a concentrated examination of them is believed by him to throw more light on the Critical Philosophy generally than can be had by following all the turns of thought and scholastic argumentation with which Kant perplexes his reader. The Analogies of Experience seek to prove that previously to experience we are able to affirm of all experience, that it must contain a permanent element as Substance, and be subject to the laws of Casuality and Reciprocity; and of these points there can be no sufficient exposition without drawing in all the most characteristic philosophical ideas of Kant. Among later thinkers, J. S. Mill and Schopenhauer chiefly engage the author's attention. With Mill he has much in common, but he justly blames him for contending with thinkers like Whewell or Hamilton, instead of meeting Kant at first hand.

Die Philosophie seit Kant. Von Dr. FRIEDRICH HARMS. Berlin, 1867. Pp. 603.

In the development of recent German philosophy the author notes

four distinct stages. The labours of Lessing, Herder, and Jacobi mark the beginnings of what is most characteristic of the philosophy of Germany, the setting-up a historical view of the world by the side of the physical. The second division contains the foundation of German philosophy by Kant. The positive result of Kant's endeavours was the establishment of an ethical theory of the world. The *Critic of Practical Reason* and the *Critic of Judgment* contain the ripest fruits of the Kantian thinking. Thirdly comes the great systematisation of German thought by Fichte, Schelling, and Hegel. Fichte sees the determining principle in Moral Purpose, Schelling in the Nature of Things, Hegel in Logical Thought. The systems of these thinkers were the necessary historical development of the doctrines of Kant. In the fourth place, we have the limitation of philosophy, determined by Schleiermacher, Herbart, and Schopenhauer. Of these, Schleiermacher stands as the representative of careful and sober criticism of the philosophy of the Absolute. In conclusion, the author devotes a few pages to the consideration of German philosophy in its most recent phases. The author sees at the present time two divergent tendencies as logical extremes of previous doctrines and systems. The one is represented by the journal founded by the younger Fichte, by Trendelenburg, and by Lotze. Here the stand-point is theistic, an Absolute being recognised as the last ground of Being and Becoming, of Action as well as of Thought. The other tendency may be styled Anthropologism, Man being taken as at once principle and end of Nature. This latter tendency is to be found in germ in Kant's *Critic of Pure Reason*, and more developed in Hegel's Natural Philosophy and in his conception of the essence of Religion. The claim of Anthropologism to be the whole of Philosophy is not however found previously to Feuerbach, the Materialists, and Schopenhauer. Whether this claim be justifiable or not is the philosophical question of the present.

Das Gesetz der Causalität in der Natur. Von ROBERT SCHELLWIEN.
Berlin, 1876. Pp. 271.

The author compares the Kantian Metaphysic with the ground-principles of modern science. The former assumed a real unknowable world, furnishing the matter of our sense-consciousness; the latter posits a world of atoms whose movements are the anterior causes of all nervous changes. Assumptions in both cases are the ground of certain subjective phenomena. But Kant's Thing-in-itself implied a contradiction as being a known unknowable. Modern science is even more irrational, as *its* unknowable is clothed with the attributes of indivisibility, impenetrability, and activity. What way out of these contradictions? None but the identification of the Phenomenon with the Thing-in-itself. The real world is the known world, and Consciousness and Existence are one. This is not to degrade the world into a merely subjective presentation. Things are in themselves as they appear to us, but all does not appear. It is the task of the higher functions of consciousness to fill up what is wanting

in sensible perception, a method which is only scientifically justified on the principle of continuity, what is underivable from sense or not to be referred thereto being devoid of authority. The sensible objective world or Nature consists of distinct things having a multiplicity of relations presented in space. The way in which one thing is related to other things determines either its position of equilibrium, or its passage into another state of equilibrium. This relation of thing to thing is natural causality. The element of time disregarded, it is asserted that the fact of the difference of things is the first member in their causal connection and the presupposition of all their possible relations. The Law of Causality runs as follows: Natural Causality consists in such a relation between things that their difference is abolished, and they become related to each other as same or identical. The author illustrates and develops this thesis at considerable length. Coming finally to a special treatment of consciousness, he says, Nature and Mind are not different things, but different functions. The function of consciousness, like every natural function, is movement in which difference is expressed in the form of identity, but the form of identity of consciousness is higher than any natural one, because it is not relation of *thing to thing*, but *absolute* relation of the conscious essence *to itself*, and therefore has no longer difference or distinction as something foreign outside itself, but as its own—in itself.

Bernardi Silvestris De Mundi Universitate Libri Duo, sive Megacosmus et Microcosmus. Nach handschriftlicher Ueberlieferung zum ersten Male herausgegeben von C. S. BARACH und J. WROBEL. Innsbruck, 1876. Pp. xxi. 71.

This is the first of a series of reproductions of philosophical works of the Middle Ages, hitherto unprinted or become rare, which will appear from time to time under the supervision of Prof. Barach of Innsbruck, entitled *Bibliotheca Philosophorum Medie Aetatis*, and designed to fill the gaps in our present knowledge of the literature of the time. "Bernard Silvester, generally known from the place where he taught as Bernard of Chartres, belongs to the most eminently cultured and influential personalities of the 12th century." The judgment of Prantl seems to the editor fully justified that the stand-point of Bernard was extreme Realism, a Realism which confronted the then rising Nominalism with the assertion of the singularity of individuals in the intelligible world. Bernard was at once poet and philosopher. *De Mundi Universitate* is written partly in prose, partly in verse. The philosophical ideas are conveyed under a mythical representation of the creation of the world and man.

SEBASTIANO TURBIGLIO: *Benedetto Spinoza e le Trasformazione del suo Pensiero.* Roma, 1875.

This work, although of marked ability, is one of the strangest which has ever been written on the philosophy of Spinoza. It passes completely over what, from the title, we naturally look for, and describes to us instead a discovery which, if true, is certainly very remarkable.

It says nothing about the various phases through which the system of Spinoza passed in its author's mind during the fifteen or twenty years which elapsed between the first written sketch—the *Korte Verhandeling van God, de Mensch, &c.*—and the final form of the *Ethica*, but is exclusively occupied with tracing the transformations of thought in the *Ethica* itself. Its general finding is that there are in that work two Spinozas, one who proceeds by syllogisms, and another who proceeds by intuitions, an apparent or phenomenal Spinoza who has hitherto been mistaken for the real Spinoza, and a true or noumenal Spinoza, who was an unconscious Leibniz, and a powerful defender of the spirituality and immortality of the soul. How has a critic of the industry and intellectual vigour and subtlety of Signor Turbiglio arrived, after five years of special study of his author, at this extraordinary result? By arbitrarily, although most ingeniously, rearranging the thoughts of Spinoza, and giving the words in which Spinoza expressed them a new meaning in their new connection. Although we cannot but think his work a failure on the whole, we cordially admit that it abounds in most suggestive combinations, and contains much excellent criticism.

GIUSEPPE DESCOURS DI TOURNOY. *Del Vero, del Bello, e del Bene*. Volume Primo. Milano, 1876.

This volume treats merely of the True, but comprehends an introduction, in which the genesis, method, and utility of philosophy are discussed, an Ideology or doctrine of the formation of notions, a Logic or doctrine of the combination of notions, a Metaphysics or doctrine of the objective conditions of truth, and an Appendix on the principles of Psychology. It is designed for general readers fully as much as for special students of philosophy. Prof. Di Tournoy has, perhaps, attempted to do more than was possible in the space he has allowed himself, especially as he has not always strictly economised it, but he is a clear writer and independent thinker. He belongs to no 'school'.

GIACINTO FONTANA: *Idea per una Filosofia della Storia*. Firenze, 1876.

The author of this work must not be confounded with Bartolomeo Fontana, whose *Filosofia della Storia nei pensatori italiani* is written from a very different point of view. He has been of late a diligent contributor to the *Filosofia delle scuole italiane*, and his book is throughout an application of the spirit and principles of the philosophy which is represented by that journal to the explanation of history. He starts with 'the idea,' the Absolute Being, and endeavours to show in what manner and measure the idea, as the highest object of thought and the ultimate end of action, has been apprehended by, and realised in, humanity. The course of its apprehension, the development of what he calls the contemplative principle, must be traced, he thinks, in the history of religion and science, while the course of its realisation, the development of the active principle, must be traced in the history of art, industry, and commerce. Such is the central idea of a

book which fortunately contains many other ideas of a less doubtful character, which displays a wide range of learning, which shows its author to be a man of considerable speculative capacity, and which is written in an interesting, although a somewhat too rhetorical, style. The distribution of contents made in it is :—(1) Introduction; (2) The ideal in history; (3) The two principles—the contemplative and active; (4) Development of the two principles; (5) Religions and Legislations; (6) Humanity; (7) Nations; (8) Civilisation; (9) Conformity of history to the speculative plan; (10) The progress of liberty; (11) Religious and civil liberty; (12) Conclusion.

XIII.—NEWS.

Mr. Philip Magnus, B. Sc., writes as follows :—

In the last number of MIND, attention is drawn to the fact, that according to the new Regulations issued by the Senate of the University of London for degrees in Science, Psychology and Logic are no longer compulsory subjects. To many who have been looking forward to the appearance of these Regulations, the intelligence that Logic as well as Psychology have been made optional subjects will be a matter of regret. To me, personally, it was a disappointment; for, at a meeting of the Committee of the Senate, which I had the honour to be asked to attend, I urged, as strongly as I could, and I had hoped with some success, the advisableness of retaining Logic among the indispensable requirements from all candidates for the B. Sc. degree.

Considering the importance of accurate thinking in all scientific pursuits, and the assistance that is obtained both in acquiring knowledge and in expressing it from an acquaintance with the principles of Logic, it is greatly to be regretted that this subject should not even have been included in the former or preliminary examination, which is, I imagine, intended to test the general scientific discipline of the student. The same importance can hardly be said to attach to Psychology, which till now formed one of the subjects of examination. But seeing that Logic, as developed by Herschell, Whewell, Mill, and Jevons, may now, perhaps, with more propriety than ever be styled *Scientia Scientiarum*, it appears somewhat anomalous that a degree in Science can be gained by men who may be wholly ignorant of the fundamental principles of this subject.

I do not wish to enter into detail with respect to the advantages which the student of Science gains from an elementary knowledge of Logic. But to the science-teacher the intellectual discipline which this study affords is of the greatest value. Even granting that facts may be accurately observed and registered, and inductions carefully drawn from them, by men who have never heard of an *experimentum crucis* or the Method of Concomitant Variations, I doubt very much whether any one who knows nothing of the laws of thought, or the principles of classification, can ever be made a good scientific teacher. Now, one of the chief uses of our B. Sc. degree is to give teachers a qualifying certificate. With this object it is principally sought after; and it commands no mean value. But I cannot help thinking that the London Science Degree will, for the future, be deprived of one of its chief merits; and that the certificate will be less likely than heretofore to indicate the fact that the holder of it has undergone some kind of training which may qualify him to become the teacher of others.

With the general character of the new Regulations I am not now concerned: but there can be little doubt that they are a great improvement on the former scheme. Looking over the list of subjects a knowledge of which will now be required from candidates for the Science Degree, it is, I admit, now difficult to say what subject should be displaced to make room for Logic; but I am inclined to think that it might have been better to have given three hours only to Experimental Physics, or to have omitted Mixed Mathematics from the preliminary examination, than to have excluded Logic altogether from the curriculum.

According to the new Regulations, candidates who choose Logic and Psychology as one of the three special subjects at the 2nd B. Sc. examination, will have *three* papers set to them instead of the two formerly set for B.A. and B.Sc. alike; and this is, so far, well. Presumably, however, if one may judge by dates, two of the three papers will still be common to the two Degrees; while it is expressly stated that the examination for Honours will be common. The arrangements altogether are open to much criticism, but the really serious matter is the question of principle reverted to by Mr. Magnus. By the surrender of Logic as a compulsory subject for the Science Degree, the credit of the University is gravely affected; and, if the authorities would but see this, no fear that a way of recovery could be found from the retrograde step.

We have received from the publisher (J. Baedeker, Iserlohn), Vol. I. of the third edition of Lange's *Geschichte des Materialismus*. It contains, besides a portrait of the lamented author, a short sketch of his life. He was only 47 when he died, on the 27th November, 1875. Till three weeks before his end he was busy with a new work, *Logische Studien*, which will shortly appear. He began this work on completing the revised second edition of his *Geschichte* in 1873. The History, now become so celebrated, appeared originally in 1865, when Lange, after having been *privat-docent* in Bonn (1855-57) and then gymnasial teacher in Duisburg, was in business as a printer and publisher: earlier in the same year had appeared his *Grundlegung der Mathematischen Psychologie*. After other changes of occupation, but always busy with philosophy, he resumed the academic life in 1870, as professor in Zürich, whence he passed to Marburg in 1872. He was also a writer of note on social and political questions, both as journalist and author. An English translation of his great work is now announced as in the press.

The hope of attaining a scientific phrenology, excited by recent physiological work on the brain, has led some French medical men and others to form a 'Society of mutual (!) Autopsy'. They say, truly enough, in their articles of foundation, that experiments on animals throw but little light on the phenomena of intelligence, and that if anything definite is known of the cerebral functions in man it has been learned by way of *post mortem* examination in hospitals. Here, however, the autopsy is marred through ignorance of the patients' antecedents, and by the fact that they belong generally to the uncultivated classes. To be in any way effective, it should be

made on the brains of men of culture and repute; and such examination, it is urged by the founders of the Society, besides increasing knowledge, would be of signal benefit to a man's descendants, as indicating weakness or morbid tendencies that might in them be checked. The members therefore bind themselves to make express disposition of their bodies, so that after death these and especially the brain and skull shall be subjected to investigation in 'the laboratory of anthropology'; interment of the remains afterwards to take place strictly according to the written directions of each person.

The Rev. John Fyfe, librarian of the University of Aberdeen, has been appointed by the Crown to the vacant chair of Moral Philosophy there.

The new German philosophical quarterly, referred to in our last number, has now appeared (in October) under the title of *Vierteljahrsschrift der Wissenschaftlichen Philosophie*. It is edited by Dr. Avenarius; not, as was formerly stated, by Prof. Wundt, who with Drs. Göring and Heinze will only co-operate. The key-note of the journal is struck in the title. It starts from the position that Science is possible only on a basis of experience, and it will occupy itself with no Philosophy that is not in this sense scientific. Its range of topics will practically coincide with that of MIND. One feature in its scheme is original. Authors of philosophical works are invited to send in short statements (from a third to half of a page in length) of what they consider to be the new or characteristic ideas in their works: these notices will be printed, on the responsibility of the writers, if they appear of sufficient importance. The advantages of the plan to authors is obvious, and we shall gladly adopt it in MIND as a means of overtaking the great variety of native and foreign literature in philosophy.

Among existing philosophical journals, there is one, *La Critique Philosophique*, appearing weekly under the direction of M. Renouvier, which has not yet received from us the attention it deserves, though it was mentioned in No. III. (p. 437). This journal, which succeeded after a break to the yearly publication of *L'Année Philosophique* by M. Pilon (a disciple of M. Renouvier's), is now in its fifth year. M. Renouvier's position will be explained to English readers in an article on the present state of Philosophy in France which will appear in a forthcoming number of MIND, and for the present we must be content to mention below (as we hope to do regularly henceforth) the chief philosophical articles in the numbers of his journal for the last quarter. The journal discusses also political questions of the day.

JOURNAL OF SPECULATIVE PHILOSOPHY. Vol. X. No. 1. G. S. Morris—'The Philosophy of Art'. J. Watson—'Empiricism and Common Logic'. . . . K. Th. Bayschoffer—'The Idea of Matter (Tyndall's Problem solved)'. Notes and Discussions. Book Notices. No. 2. J. Watson—'Kant's reply to Hume'. J. H. Pepper—'Darwin's Descent of Man'. . . . L. P. Hickok—'The two kinds of Dialectic'. H. Haanel—'Herbart's Ideas on Education'. . . . W. T. Harris (Editor)—'The Relation of Religion to Art'. Book Notices. No. 3. Editor—

'History of Philosophy in Outline'. J. Watson—'Hedonism and Utilitarianism'. T. Gray—'Science in Government'. J. Lachelier—'The Basis of Induction' (transl.). Kant's *Anthropology* (section transl.).

REVUE PHILOSOPHIQUE. No. X. James Sully—'L'Art et la Psychologie'. J. Delboeuf—'La Logique Algorithmique' (ii.). E. Cazeilles—'La Morale de Grote'. L. Ferri—'Le Procès de Galilée d'après des documents inédits'. Observations et documents—'La continuité et l'identité de la conscience du moi', par A. Herzen. Analyses et comptes-rendus. Revue des Périodiques, &c. No. XI. L. Tannery—'La Géométrie Imaginaire et la notion d'Espace'. L. Dumont—'M. Delboeuf et la Théorie de la Sensibilité'. J. Soury—'L'Histoire du Matérialisme de Lange' (ii.). Observations et documents—'De la transformation du sens de certains mots', par A. Darmesteter. Analyses et comptes-rendus. Revue des Périodiques, &c. No. XII. J. Delboeuf—'La Logique Algorithmique' (fin.). Th. Ribot—'La Psychologie Ethnographique en Allemagne'. J. Soury—'L'Histoire du Matérialisme de Lange' (fin.). Analyses et comptes-rendus, &c.

LA CRITIQUE PHILOSOPHIQUE.—Vme. Année, Nos. 36-45. C. Renouvier—'Un point d'histoire naturelle mentale' (36); 'Les labyrinthes de la métaphysique: L'infini et le continu, Stuart Mill' (37), 'Herbert Spencer' (42), 'Hegel et M. Shadworth Hodgson' (44); 'De la ressemblance mentale de l'homme et des autres animaux selon Darwin' (38). Bibliographie: Spencer, *Social Statics* (43); Michaut, *De l'Imagination* (45).

LA FILOSOFIA DELLE SCUOLE ITALIANE.—Vol. XIV. Disp. 1. F. Bonatelli—'La Filosofia dell'Inconscio'. T. Mamiani—'Della Evoluzione'. Bulgarelli—'Sul trattato della Coscienza del Prof. Ferri'. Bibliografia, &c. Disp. 2. T. Mamiani—'Della Evoluzione'. L. Ferri—'Il metodo psicologico e lo studio della coscienza'. Mamiani—'Filosofia della religione'. A. Valdarnini—'Effetti delle moderne teorie filosofiche nelle scienze morali e sociali'. Bibliografia.

VIERTELJAHRSSCHRIFT FÜR WISSENSCHAFTLICHE PHILOSOPHIE.—I. Heft 1. R. Avenarius—'Zur Einführung'. Fr. Paulsen—'Ueber das Verhältniss der Philosophie zur Wissenschaft'. A. Riehl—'Die Englische Logik der Gegenwart'. W. Wundt—'Ueber das Kosmologische Problem'. J. Kollmann—'Aus dem Leben der Cephalopoden'. Selbstanzeigen. Bibliogr. Mittheilungen.

ZEITSCHRIFT FÜR PHILOSOPHIE, &c.—Bd. LXIX. Heft 1. Steffens—'Gewinn für die Kenntniss der Gesch. der griech. Phil. aus den Schriften des Aristoteles' (Schluss). Richter—'Kant als Aesthetiker'. Rehnisch—'Untersuchungen u. Ergebnisse der Moralstatistik' (ii.). Recensionen. Heft 2. Spicker—'Mensch u. Thier'. Müllerner—'W. Rosenkrantz' Philosophie' (i.). Recensionen. Bibliographie.

PHILOSOPHISCHE MONATSHEFTE.—Bd. XII. Heft 6, 7. E. Bratuscheck—'Summi in philosophia honores'. Krohn, *Studien zur sokratisch-platonischen Literatur* (recens.); I. H. Fichte, *Fragen u. Bedenken über die nächste Fortentwicklung deutscher Speculation* (recens.). Bibliographie. Heft 8. Spicker, *Kant, Hume u. Berkeley* (recens.); Hermann, *Aesthetische Farbenlehre u. Die Aesthetik in ihrer Geschichte u. als wissenschaftliches System* (recens.); Heppel, *Geschichte der quietistischen Mystik* (recens.). Bibliographie, &c. Heft 9. H. F. Müller—'Plotin u. Schiller über die Schönheit'. Paulsen, *Kantische Erkenntnistheorie* (recens.); Hume, *Untersuchung in Betreff des menschl. Verstandes*, übers. von Kirchmann (recens.). Todtenhaupt—'Mechanismus u. Teleologie'. Bibliographie, &c.